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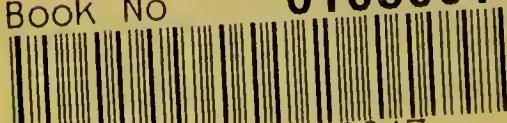
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ON

THE IDENTITY OR NON-IDENTITY

OF

TYPHOID AND TYPHUS FEVERS.

BY

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THESE FEW PAGES

ARE DEDICATED TO

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AS A TRIFLING TOKEN OF GRATITUDE FOR THEIR KINDNESS AND CONSTANT

ATTENTION

TO THE AUTHOR

WHILE SUFFERING FROM ONE OF THE DISEASES WHICH HE HAS HERE
ATTEMPTED TO ELUCIDATE.

P R E F A C E.

A FEW words only are needed as preface to the following pages. The reader must not suppose that the importance of the labours of others on the subject there considered is underrated, because no special references have been made to them. I am deeply sensible of the value of the writings of Gerhard, Shattuck, Valleix, Louis, Stewart, Bartlett, &c.; but, notwithstanding their researches, the question of the specific difference of Typhoid and Typhus Fevers was considered by some of those who had most closely criticised the papers referred to, as settled, or likely ultimately to be settled, in the negative. "We venture," said the reviewer of Dr Bartlett's book, in the "British and Foreign Medical Quarterly" of April 1844, "to prognosticate, that the ultimate issue of the investigation will show the truth of a remark of Dr Southwood Smith, that 'there is but one kind of idiopathic fever;'" and again, "we remain, then, of the same opinion, that the continued fever of England and France are the same species of disease." I considered, therefore, that it was necessary to begin *de novo*, and consult only the voice of nature,—convinced that, although the most intellectual might fail at first to comprehend her often ambiguous language, yet that her most humble votaries might, by patience and daily watching, by keeping honest record of every sound she uttered—by joining letter to letter, adding word to word, and line to line—at last

spell out her meaning, and so reach that rank which the great master of induction tells us man may legitimately hope to attain—viz., that of her interpreter. The consciousness of his ability to gain that title ought to stimulate man to exertion—the certainty that he is able to reach no higher cannot fail to annihilate his pride.

8, ALBANY STREET, REGENT'S PARK,
LONDON.

ON TYPHOID AND TYPHUS FEVERS.

INTRODUCTION.

IT is beyond dispute that there are large groups of diseases arranged under the same heads in systematic works on medicine, of which the only bonds of union are, that their nature is unknown, and that they present in common certain pretty constant and striking symptoms.

Of these ill-defined anomalous groups, continued fever is one of the most remarkable and important. To trace the relations, and to detect the differences of the incongruous mass of diseases united together under this name, only the most careful analysis of daily recorded clinical observations can suffice.

The memory is too treacherous to be depended on in the science of medicine, in which the effects of primary are complicated by the effects of secondary lesions, and in which observation has to be corrected by observation.

For the elucidation of its obscurer points, no loose or general statements are of use—the most rigid induction can alone avail.

It would be a great point gained towards the right understanding of the true value of the differences observed in cases known as continued fever, if the question raised by Louis could be positively answered—no matter whether in the affirmative or negative—as to the identity of typhus and typhoid fevers; that is to say, have or have not British physicians confounded under the term continued fever, two *essentially* distinct diseases?—the one characterized by an anatomical lesion peculiar to it, and distinguishing it from all other acute diseases, the other exhibiting no certain anatomical character, and each presenting symptoms by which it can with more or less facility be distinguished from the other.

It will be necessary, before proceeding further, briefly to explain what is meant by the terms identity and non-identity, as applied to cases of typhus and typhoid fevers.

A given case of any disease always differs more or less from all other cases of the same disease, and therefore it may be said that no two are identical ; but it is not with this kind of identity that we have here to do. It is not regarding differences in degree, but in kind, that question is here made.

Whether the primary affection is identical in typhus and typhoid fevers is the problem to be solved. Are the differences allowed to exist between them due simply to individual peculiarities, atmospheric differences, epidemic constitutions, or hygienic conditions, giving rise to local complications in the one which are absent in the other, and to variations in the symptoms as a consequence of these local complications ? Or are they distinct diseases, as are scarlet fever and small-pox ?—distinct as to their primary or exciting cause, their essential symptoms, and anatomical lesions. It may be as well, before proceeding further, to anticipate a little, and to state that the conclusion necessarily drawn from the analysis about to be submitted to the reader of sixty-six fatal cases of fever, is in opposition to the opinion of the principal writers on the subject of continued fever in this country. With few exceptions, British physicians have laboured to prove that typhoid and typhus fevers are identical. The results obtained by this analysis justify the assertion, that they are essentially distinct diseases. This difference from the opinion of others, I should be slow to express if I was not supported by a larger body of facts, than, so far as I am aware, has ever been offered in evidence to prove the identity of the two fevers. To those who delight to dwell on the imperfections common to all analysis of cases, who smile at any attempt to improve medicine by rigid induction, the value of the figures presented for their consideration may be increased by the following general assertion, that for two years, in distinguishing the two diseases by the eruption alone, not a single error has been made, so far as could be proved by examination after death of the fatal cases, or by the progress of the non-fatal cases after their diagnosis was recorded.

Two cases cannot seem to differ more, to a superficial observer, than a slight sore throat, the result of exposure to the poison of scarlet fever, and a case of scarlatina anginosa, or than a mild case of scarlatina simplex and one of scarlatina maligna ; yet no one now doubts the identity of the two, *i. e.*, as we here use the word, or that however much they may differ, it is in degree and not in kind, for we find every variation in the severity of the throat affection, and in the intensity of the rash uniting the two extremes ; the latter may be present or absent, but if present is similar in character, though more vivid in the one case than in the other. The former is trifling or absent in the one, fearfully severe in the other ; and it may be remarked that these two symptoms of the disease bear no necessary

relation in severity the one to the other. In like manner, how different a mild case of modified smallpox from one of variola maligna; yet that they are varieties of the same disease is undoubted. No one, however, questions the non-identity of scarlet fever and smallpox. Although there are some symptoms common to the two diseases, and others which, more frequent in the one, are occasionally present in the other—*e. g.*, rigor, chilliness, followed by heat of skin, headache, delirium, somnolence or coma, hoarseness, sore throat, dysphagia—one or all of which symptoms may be present in either disease. In both there is an eruption of the skin, and though the usual period of its appearance differs, that of scarlet fever may not make its appearance till the third day, and the first symptoms of smallpox may have been so mild, that the patient will assert that he has been ill only two days when the skin affection appears.¹ The duration of the two generally differs; but the illness of the person attacked by either, may be prolonged by local complications to an indefinite period, and so the duration of the disease, which is the shorter, may in some cases appear to be the longer.

On what grounds, then, do we assert that they are two diseases?

1st, In the vast majority of cases the general symptoms differ.

2d, The eruptions, the diagnostic characters if present, are never identical.

3d, The anatomical character of smallpox (in this particular case also the eruption) is never seen in scarlet fever.

4th, Both being contagious diseases, the one, by no combination of individual peculiarities, atmospheric variations, epidemic constitution, or hygienic conditions, can give rise to the other.

5th, The epidemic constitution favourable to the origin, spread, or peculiarity in form or severity of either, has no influence over the other, excepting that which it exercises over disease in general.

By the anatomical character of a disease I intend to signify that lesion, or those lesions of structure which are the invariable concomitants of a disease if it has continued for a given time, which time must be determined by a separate series of observations for every distinct affection. The anatomical character is not, be it remarked, and this is of immense importance, necessarily the cause of the disease, for it may be merely a symptom; but then, if the disease be not cut short by death, it is an invariable symptom. Thus the anatomical character of smallpox is the distinctive pustule; but the patient may die before that lesion of structure has been deve-

¹ So like too is the rash, which often precedes by a day the eruption of the pustules in smallpox, to the rash of scarlet fever, that those conversant with the two diseases may be led to form an erroneous diagnosis. Cases are constantly sent into the London Fever Hospital, with certificates stating they are suffering from scarlet fever, the true nature of the case not appearing till the day after their admission.

loped, and yet die of smallpox—the condition of the blood or nervous system, induced by the absorption of the poison, having been incompatible with a duration of life sufficiently long for the change of structure to take place. But the anatomical character may be the cause of death, and that before the primary disease has run its full course; or it, or its effects, may remain after the original disease has disappeared, and retard recovery, or even finally prove fatal to the patient. Again, the anatomical character being merely the invariable concomitant of a disease, and not necessarily its cause, it is evident that the extent of the lesion of structure constituting that character, need bear no relation to the violence of the essential symptoms of the disease. It must not be supposed that the question of the identity or non-identity of typhus and typhoid fevers is merely one of words—that its solution has no practical bearing—that it is a matter of indifference whether the latter be regarded as typhus with abdominal complication, or as a distinct disease. If continued fever be one disease, the *essential* treatment must be the same in every case, modified only by the presence of local complications; if two diseases,¹ then the essential treatment *may be* totally different for the one from that required by the other, and this without regard to local complications. The very groundwork of the treatment, so to speak, may for the one be diametrically opposed to that necessary for the other.

To illustrate the extreme practical importance of the point, we need only remember that, till a comparatively late date, scarlet fever and measles were viewed as the same disease. Of what value would any dissertation on the general treatment of the two have been, so long as they were thus confounded, even though the local complication of scarlet fever—*i. e.*, the throat affection—had been taken into consideration? The cold sponging or douche, so beneficial in scarlet fever, might be death to a patient suffering from measles.

London alone, of all the cities of Europe, from the fact of fever with and without intestinal disease being almost constantly present within its bounds, afforded a field for observation capable of settling the vexed question at rest.

In Edinburgh, writes Dr Christison, the intestinal lesion is seen often enough only to prevent physicians being ignorant of its characters. In Dublin it appears to be equally unfrequent. While on the Continent fever without lesion of the agminated glands is so rare, that many eminent practitioners have doubted the existence of such an affection.

The London Fever Hospital, by collecting within its walls cases of continued fever from all parts of the great metropolis, offered peculiar facilities for its study; and I am indebted to the medical

¹ From observations made on from 1000 to 2000 cases of continued fever, admitted into the London Fever Hospital, I think it probable that there are in this country at least four distinct continued fevers.

officers of that institution for permission to avail myself of the advantages it presented. To Dr Tweedie, the senior physician to the hospital, so long known and so highly appreciated by the profession for his researches on fever, I beg especially to acknowledge my obligations. To my talented friend, Mr Sankey, M.B., I am also greatly obliged for his readiness to assist me on all occasions, and for many valuable suggestions and observations.

In examining the subject of this paper—one beset with extreme difficulties, not so much from its own intricacy as from the mode in which fever has been treated of by the hosts who have chronicled its symptoms and its phases—I have endeavoured to bear the following rules constantly in mind:—

That the facts known with absolute certainty were to be kept distinct from those only approximatively ascertained.

That although, in order to settle a point of such moment, many cases were required, yet that a few observations, carefully and honestly made, were of more value than a multitude of general statements.

That the question at issue—*i. e.*, of the identity or non-identity of typhus and typhoid fevers—involving not only a consideration of symptoms but also of internal lesions, it was absolutely necessary that the latter should be demonstrated, and the former recorded, in every case that was to be admitted as evidence in determining the judgment.

I have during the last two years made notes of nearly 1000 cases of acute disease, chiefly of patients under the care of Dr Tweedie, at the London Fever Hospital—of these, sixty-six were cases of continued fever, which proved fatal, and were examined by me after death.

For the reasons before stated—*i. e.*, the absolute necessity of the condition of the intestinal mucous membrane being demonstrated, and not surmised, with however great an amount of probability that might be—I have excluded from my present calculations all those cases which did not prove fatal; all those cases which, although they died, were not examined after death; and all those which I examined after death, but whose symptoms I had not noted during life.

These sixty-six fatal cases I have divided into two groups, placing in the one the cases in which disease of Peyer's patches existed; in the other, those in which, so far as the unassisted eye could determine, the agminated glands were in a healthy condition. Of these sixty-six cases, forty-three belonged to the latter group, or were cases of typhus fever; the remaining twenty-three being cases of typhoid fever.

I propose, in the first place, to take certain general conditions and the symptoms presented by either disease, and compare them with those which existed in the other; and then, in like manner, to collate the appearances found after death.

YEARS AND MONTHS IN WHICH THE SIXTY-SIX CASES HERE
ANALYSED WERE ADMITTED.

<i>Typhoid Fever.</i>		<i>Typhus Fever.</i>	
1847.		1847.	
Months.	Cases.	Months.	Cases.
January	1	April	1
February	1	May.....	4
August	4	June	1
November	1	July	5
		September	3
		October	3
		November	1
1848.		1848.	
June	3	May.....	5
July	2	July.....	3
August	2	August	1
September	3	September	3
October	2	October	2
November	1	November	5
December	2		
1849.		1849.	
January	1	January	5
February		February	1

PREVIOUS HEALTH, GENERAL BODILY CONDITION, AND SIZE.

Typhoid and Typhus Fevers.—The patients, as a general rule, had enjoyed uninterrupted health before the attack from which they died, and were, in the large majority of cases, of robust bodily conformation, and, if admitted soon after the commencement of either disease, moderately stout.

The size of patients suffering from the two was nearly equal; thus, in *typhoid fever*—

Of the Males,
The mean height was 5 f. 5½ in.
The tallest 5 f. 10½ in.
The shortest 5 f. 2 in.

Of the Females,
The mean height was 5 f. 1½ in.
The tallest 5 f. 5 in.
The shortest 5 f.

In *typhus fever*—

Of the Males,
The mean height was 5 f. 4½ in.
The tallest 5 f. 10½ in.
The shortest 4 f. 10 in.

Of the Females,
The mean height was 4 f. 7½ in.
The tallest 5 f. 6 in.
The shortest 4 f. 6 in.

COMPLEXION.

Typhoid Fever.—Twelve out of fifteen of the patients, or 80 per cent., were noted as of fair complexion.

Typhus Fever.—Eight only out of twenty-six of the patients, or 30·7 per cent., of whom notes on the point were made, were fair; but here a fallacy exists, as will be shown when speaking of the

aspect of the patients while suffering from this disease. Many, whose complexions were extremely dark when admitted with typhus fever, became comparatively fair as the disease disappeared. Of course this could only be observed in patients who recovered.

SEX.

Of the patients labouring under *typhoid fever* whose cases are here considered, thirteen were males; ten females.

Of forty-three case of *typhus fever*, twenty were males; twenty-three females.

AGE.

Typhoid Fever.—The average of the ages of the twenty-three patients affected with this disease was 22.08 years. The youngest was ten years old; the eldest thirty-six.

There were—

Between the ages of 10 and 19, both years inclusive,	8 patients.
... ... 20 and 29,	... ... 12 ...
... ... 30 and 36,	... ... 3 ...

Typhus Fever.—The mean age of the forty-three patients suffering from this affection was 41.8 years. The youngest was eight years old, the eldest seventy.

There were—

Between the ages of 8 and 19, both years inclusive,	5 patients.
... ... 20 and 29,	... ... 4 ...
... ... 30 and 39,	... ... 9 ...
... ... 40 and 49,	... ... 12 ...
... ... 50 and 59,	... ... 6 ...
... ... 60 and 69,	... ... 6 ...
Of the age of	70,

MODE OF ATTACK, AND THE DATE OF THE DISEASE ON WHICH THE PATIENTS WERE FIRST CONFINED TO BED.

Typhoid Fever.—No data to determine the mode of attack could be obtained in six of the twenty-three cases. The disease, in seven only of the remaining seventeen cases, began so suddenly that the exact day of its commencement could be ascertained; six out of the seven took to their beds respectively on the 1st, 1st, 2d, 3d, 10th, and 16th days;¹ the last two patients, however, were obliged to lie down part of the day from an early period in the disease. No note was taken of the time when the seventh first kept his bed.

In the remaining ten of the seventeen cases, the disease began

¹ In reckoning the day of the disease, both the day on which it commenced and the day on which the event referred to happened, whatever that may be, have constantly been included in the calculations. Thus a patient who entered the hospital on the 9th of a month, and whose illness began on the 4th, would be stated to have been admitted on the 6th day of the disease.

gradually. Of these, four were ailing for a few days, and then became suddenly worse; three of the four took to their beds respectively on about the 7th, 8th, and 11th days of the disease. The other six of the ten in whom the disease began insidiously, could fix on no particular day as that on which their illness began, but only stated that they became gradually ill from about a given day; of these, four took to bed severally on about the 3rd, 7th, 12th, and 17th days of the disease—when the others first kept their bed was uncertain. So that only 28·5 per cent. took to bed before the 7th day.

Typhus Fever.—Of sixteen of the forty-three cases no particulars as to whether the disease began suddenly or insidiously could be obtained.

Of the remaining twenty-seven cases, twenty-three were taken ill suddenly; nineteen of these twenty-three cases first kept their beds as follows:—

4 On the 1st day of the disease.	3 On the 4th day of the disease.
6 ... 2d day	1 ... 6th day
5 ... 3d day	

Thus all these patients were confined to their beds before the 7th day. Of these twenty-three cases, when four took to their bed was not learned. In four of the twenty-seven cases of which a correct history was obtained from the patients or their friends, the disease began insidiously, so that the day of its commencement could not be exactly ascertained, but they took to their beds on about the 2d, 3rd, 4th, and 6th days; so that, if this group be added to the first, every patient may be said to have been confined to bed by the 6th day; while, as we have seen, 28·5 per cent. only of the patients affected with typhoid fever took to bed before the 7th day.

DURATION.

Typhoid Fever—Seven cases were received into the hospital respectively on the 4th, 5th, 6th, 8th, 10th, 12th, and 16th days of the disease, the average day of admission being the 8·7th.

Of thirteen patients, the exact duration of whose illness before they entered the hospital could not be ascertained—

1 was admitted on about the 7th day of the disease.	2 were admitted on about the 15th day of the disease.
1 9th ...	1 19th ...
1 12th ...	2 21st ...
1 13th ...	1 27th ...
3 14th ...	

These thirteen cases were thus admitted on about the 14·5th day of the disease; one as early as about the 7th day, and one as late as about the 27th day.

The disease began gradually in these thirteen cases, so that the date of its commencement could not be accurately fixed; but four out

of the thirteen cases became suddenly much worse, after from three to eleven days indisposition; and it is singular that, if the disease be reckoned to have commenced from the time of the sudden increase in the severity of the symptoms, and to which moment the patients themselves usually referred the beginning of their illness, the average day of the disease on which these four cases entered the hospital will exactly agree with the average day of the disease on which the patients were admitted, the precise commencement of whose illness was clearly ascertained—*i. e.*, both will have been admitted on the 8·7th day.

If the dates of the disease on the admission of the latter group of cases (being considered as nearly correct) are added to those of the first group of cases, it will be found that 23·5 per cent. only were admitted before the 9th day of the disease.

I omit one patient who had been ill, probably more than three weeks when admitted, and lived till after the 21st day from her entrance; and two cases in which the duration of the disease, prior to the day they first came under observation, was unknown. These patients remained in the hospital three and eight days before the fatal termination.

Of the seven cases, the exact date of whose illness on admission was known, three survived till after the fever had run its course. The other four died respectively on the 12th, 17th, 20th, and 27th days of the disease—the average day of death of these four cases being the 19th. This is probably below what a larger number of cases would give, because one case proved fatal on the 12th day from severe pneumonia.

Of the thirteen cases in which the duration of the disease before the patients were received into the hospital was only more or less nearly ascertained, six lived some time after the termination of the typhoid fever, and the remaining seven died severally on about the 16th, 17th, 23d, 25th, 27th, 28th and 30th day of the disease. The average day of death, dating from the commencement of illness, being for these seven cases 23·7, this average probably, for the reason above stated, is nearer the truth than that obtained from the first group of cases, or those in which the exact date of the illness was ascertained.

This close relation between the average day on which the disease proved fatal in the two groups—*i. e.*, the group in which the exact date of the disease on admission was accurately fixed, and that in which it was only approximately ascertained—renders it probable that, in spite of the late date of the disease at which the second group entered the hospital, the mildness of their first symptoms, and then their sudden increase in severity, I have done right in dating the commencement of the illness from the moment when the patients first felt themselves ailing, and not from the time when they became suddenly worse.

If the two groups be added together, it will be seen that ten out

of the eleven cases—*i. e.*, 90·9 per cent.—survived till after the fifteenth day, the only exception being the patient who died of pneumonia on the 12th day of the fever.

Twelve¹ of the twenty-three cases here analysed proved fatal during the progress of the fever. The average day of residence in the hospital on which these patients died was the 10·5th. One case proved fatal on the 3rd day; and one lived till the 20th day after admission.

Ten survived the fever; but the duration of the disease in one of these cases was too uncertain for it to be taken into calculation.

Dating from the commencement of illness, the remaining nine cases proved fatal, on an average, about the 47th day—one of the patients dying on the 32nd, and one as late as the 86th day; or, counting from their entrance into the hospital, one lived till the 20th day, and one till the 79th day—or they died, as an average, the 32nd day of their residence in the hospital.

Typhus Fever.—The exact day of the disease on which the patients were admitted into the hospital (omitting one case, that of a nurse who resided in the institution), was ascertained in twenty-two cases to be as follows:—

1	was admitted on the 5th day of the disease.	5	were admitted on the 9th day of the disease.
2	..	2	12th ..
4	..	1	14th ..
7	..	8th	...

The day of the disease on which nine of the forty-three patients were admitted, was only approximately learned. Of these—

1	was admitted on about the 4th day of the disease.	1	was admitted on about the 9th day of the disease.
1	..	5th	...
2	..	7th	...
1	..	8th	...

So that the twenty-one patients, the commencement of whose illness was clearly made out, were, on an average, admitted into the hospital on the 8th day of the disease—one entering as early as the 5th, and one as late as the 14th day; and the nine patients, the exact date of whose illness was not quite accurately ascertained, were, on an average, admitted on about the 8·6th day of the disease—one entering as soon as about the 4th day, and one as late in the disease as about the 14th day. Or, if the two groups be added together, it will be seen that as many as 61·29 per cent. were admitted before the 9th day of the disease, whereas only 23·5 per cent. of the cases of typhoid fever were admitted before the 9th day.

The duration of the disease, prior to the patient's entrance into the hospital, was entirely unknown in eleven cases. Of these, four sur-

¹ One case is here omitted, because I have not the data to determine whether it proved fatal before or after the fever had run its course.

vived after the fever terminated. Out of the twenty-three cases in which the exact day of the commencement of the disease was accurately fixed, five recovered so far as the fever was concerned. Of the remaining eighteen patients—

1 died on the 10th day of the disease.	|	1 died on the 15th day of the disease.
2 ... 11th ... ...	|	2 ... 16th
2 ... 12th ... ...	|	2 ... 17th
3 ... 13th ... ...	|	1 ... 19th
3 ... 14th ... ...	|	1 ... 20th

The average day of the disease on which death in these eighteen cases occurred, was the 14·27th; one dying on the 10th day, and one not till the 20th day.

Of the nine cases in which the day that the disease began was only approximately ascertained, two died after the fever had run its course. Of the seven cases which proved fatal during the progress of the fever—

1 died on about the 9th day.	|	1 died on about the 15th day.
1 ... 11th ...	|	1 ... 16th ...
1 ... 13th ...	|	2 ... 17th ...

The average day of the disease on which these seven cases died, being about the 14·4th day—one terminating fatally on about the 9th day, and one as late as about the 17th day. Or, if the two groups of cases be taken together, it will be seen that 36 per cent. only proved fatal after the 15th day of the disease, and not one after the 20th day; presenting in this particular a striking contrast to the cases of typhoid fever, of which, as we have seen, 90·9 per cent. proved fatal after the 15th day, and nearly one half after the 20th day.

Thirty-two cases proved fatal during the progress of the fever. The average day of residence in the hospital on which these patients died was the seventh—two dying on the third day after their admission, and one surviving till the sixteenth day.

The six patients (omitting one who died of smallpox) that recovered from the attack of typhus, and the date of the commencement of whose illness was ascertained, or nearly so, died respectively on the 22d, 23d, 24th, 29th, 44th, and 148th days, reckoning from the outset of the disease; the day of death of these patients being respectively the 19th, 18th, 17th, 17th, 31st, and 141st of their residence in the hospital.

The four patients, the duration of whose illness before admission was unknown, and who died of diseases that supervened during the progress of the typhus, and continued after that had run its course, or that began after its termination, died severally on the 11th, 12th, 16th, and 30th days after they were admitted into the wards.

ERUPTION.

Description of the Rose Spots peculiar to Typhoid Fever.—The eruption in the cases of typhoid fever here analysed, was papular. The

papulae, called by Louis *taches roses lenticulaires*, possessed the following characters :—

They were slightly elevated. To detect the elevation the finger had to be passed very delicately over the surface, as they had none of the hardness of the papulae of smallpox, or of the first day's eruption of smallpox. Their apices were never attenuated, never flat, but invariably rounded—their bases gradually passed into the level of the surrounding cuticle. No trace of a vesicle or white spot of any kind was ever detected on them. They were circular and of a bright rose colour, the latter fading insensibly into the natural hue of the skin around. They never possessed a well-defined margin.

They disappeared completely on pressure, resuming their characteristic appearances as soon as the pressure was removed, and this was true from first to last, from their first eruption to their last trace. They left no stain of the cuticle behind ; they never passed into any thing resembling petechiae—the characters they presented on their first appearance continued till they vanished. Their ordinary size was about a line in diameter, but occasionally they were not more than half a line, and sometimes a line and a half in diameter.

The duration of each papula was three or four days ; fresh papulae made their appearance every day or two. Sometimes only one or two were present at first, ran the course above described, and then one or more fresh ones made their appearance, vanished in three or four days, and were followed by others to last as long.

The number of papulae seen at one time on the surface was ordinarily from six to twenty—though occasionally there was only one, and sometimes more than one hundred.

They usually occupied the abdomen, thorax, and back, but were occasionally present on the extremities. One was frequently noticed on the thorax over the cellular interval, at the upper border of the pectoralis major on either side.

A *very pale and delicate scarlet tint* of the skin sometimes preceded the eruption of the papulae, but never lasted more than a day or two. The skin resembling in tint that of a person shortly after leaving a hot bath.

Rose spots were present in nineteen of the twenty-three fatal cases here analysed.

There was no eruption detected in four cases.

The date of the first appearance of the papulae was ascertained in three cases, which commenced suddenly, and was the 8th, 12th, and 20th days ; the patients being admitted respectively on the 4th, 5th, and 10th days of the disease.

In a fourth case, in which the papulae first appeared on nineteenth day, the patient, a strong made butcher's man, left his work only eight days before the eruption appeared, but had been ailing for ten days before he left his work.

The papulae were present in thirteen cases when the patients first came under observation—three of these cases being seen for the first

time on the 9th, 13th, and 18th day of the disease; five on about the 8th, 10th, 12th, 16th, and 22d day; and two on about the 15th, and two on the 28th day. In one case no clue to the duration of the disease before the patient's admission could be obtained.

In two cases the date of the first appearance of the spots was not noted;

Of the four cases in which no spots were detected, three had been ill before they entered the hospital more than fourteen days, and one probably more than three weeks.

The longest time any given papula remained visible was six days, the shortest time one day. The average duration of each spot, calculated from repeated observations on nine of the cases here analysed, each observation including several spots, was 3·14 days.

In three cases which proved fatal on the 32d, 34th, and 86th days, fresh spots made their appearance as late as the 29th, 21st, and 24th¹ days. The first of these cases proved fatal from peritonitis, the other two died of erysipelas.

In seven cases which proved fatal on about the 23d, 25th, 28th, 30th, 44th, 46th and 71st days, fresh spots were observed to appear respectively, as late as about the 19th, 15th, 24th, 24th, 23d, 24th, and 30th days of the disease. Of these patients, the first three, or those who expired as nearly as could be ascertained before the 30th day, died chiefly from the abdominal lesion.

The last four died respectively of pneumonia, sloughing, erysipelas, and pleuro-pneumonia and sloughing.

No second crop of papulae was observed in seven cases, the patients dying on the 2d, 3d, 3d, 5th, 6th, 7th, and 15th days, after they came under observation.

In the two cases in which the date of the first appearance of the spots was not noted, the presence or absence of more than one crop of papulae was not recorded.

To sum up—

1. Rose spots were detected during the progress of all the cases admitted before the fourteenth day of the disease.

2. The spots usually appeared between the seventh and fourteenth days after the first symptoms of the disease showed themselves.²

3. The ordinary duration of each spot was three days.

4. Fresh spots generally appear every day or two after their first eruption, till from the twenty-first to the thirtieth day.

5. One case relapsed, and in that fresh papulae appeared every day or two till the twenty-fourth day, then no more were seen till

¹ This patient had a relapse after convalescence was partially established, and then spots re-appeared and continued as late as the forty-ninth day.

² I would here remind the reader, that as these particulars are deduced from a limited number of fatal cases, the exact days of the first and last appearance of the eruption seem to be a little more irregular than they really are. It is well known that fatal cases of smallpox and scarlet fever are not the best fitted for exhibiting the regular course of the eruption in the two diseases.

the thirty-seventh day, after which fresh spots were again noted daily till the forty-ninth day, reckoning from the first outset of the disease.

6. The fever terminated by the thirtieth day, as proved by no fresh spots appearing after that day, unless in the case of a relapse, and by the presence of local complications sufficient to account for death in all cases that proved fatal after that date.

Description of the Mulberry Rash¹ peculiar to Typhus Fever.—In the cases of typhus fever, the eruption was never papular. Its characters varied with its duration. On the first appearance of the rash, it consisted of very slightly elevated spots of a dusky pink colour. Each spot was flattened on the surface, irregular in outline, had no well-defined margin, but faded insensibly into the hue of the surrounding skin, disappeared completely on pressure, and varied in size from a point to three or four lines in diameter. The largest spots appeared to be formed by the coalescence of two or more smaller, and the shape of the former accordingly was more irregular than that of the latter.²

Second Stage.—In one, two, or three days, these spots underwent a marked change; they were no longer elevated above the surrounding cuticle, their hue was darker and more dingy than on their first appearance, their margins rather more, but still imperfectly defined, and now they only faded on pressure.³

In this stage they were usually darker, less affected by pressure, and their margins more defined on the posterior than on the anterior surface of the body. In some cases the spots after this grew paler, passed into faintly marked reddish-brown stains, and then disappeared.

Third Stage.—In others a third stage was reached, the centres of the spots became dark purple, and remained unaltered by pressure, although their circumferences still faded; or the entire spots, the circumferences as well as the centres, changed into true petechiae, *i.e.* spots presenting the following characters,—a dusky crimson or purple colour, quite unaffected by pressure, a well-defined margin, and total want of elevation above the level of the cuticle. This alteration was most frequently observed to take place on the back, at

¹ I have ventured to use a new term for designating the rash peculiar to typhus, because I consider it unadvisable to retain any of the names now in use, limited as each of those names is to a peculiar modification of the one rash here described. In consequence of the eruptions in scarlet and typhoid fevers having received names from their colour, and the rash of typhus fever often resembling in hue the stain of the mulberry, I have been led to adopt the above term.

² In some cases it was doubtful if the spots on their *first* appearance had not the characters here assigned to them as their *second* stage.

³ By the term "faded on pressure," I intend to signify, that however firmly the finger was pressed on the spots, they could not be entirely obliterated, but some trace of the spots or stain of the cuticle remained.

the bend of the elbow, and in the groin. At the bend of the elbow they were generally oval, their long axis lying in the direction of the long axis of the arm.

In a large majority of the cases, the spots were very numerous, close together, sometimes almost covering the skin. In a few instances, however, they were comparatively few in number, very pale, and situated at some distance from each other.¹

The usual situation of the spots was the trunk and extremities, but occasionally they were limited to the trunk, and now and then were observed on the face.

Their number reached its maximum on the first, second, or third day, no fresh spots appearing after the latter date, and each spot remained visible from its first eruption till the whole rash vanished.

When very numerous, the whole of the spots seen together on the surface had not an equal depth of colour, many were much paler than the others, and had a dull appearance as if seen through the cuticle. In my notes I have been in the habit of distinguishing these collectively as the subcuticular rash. *It often, by its abundance, gave a mottled aspect to the skin, on which ground the darker spots were seated.*

Variations in the absolute or relative amount of the subcuticular rash, and of the spots, as well as in the depth of their respective colours, cause much difference in the general appearance of the rash. Sometimes it resembles measles so closely as to be distinguished from it with difficulty; at others, it presents that appearance which has been called the spotted rash; and again, it is sometimes so pale, that unless carefully looked for it might be passed over altogether. When the spots on the back were of a much deeper hue than those on the anterior surface of the trunk, the skin covering the posterior surface was generally considerably congested. Slight pressure of the finger leaving a white mark, which slowly returned to its previous dusky red colour.

The eruption mulberry rash, characteristic of typhus fever, was observed in all of the forty-three cases of that disease here analysed.

The rash appeared in two cases after the patients' admission into the hospital; the date of its first eruption in these two cases was the seventh and ninth days. In the remaining forty-one cases, the rash was developed before the patients came under observation.

Of these forty-one cases—

¹ In these cases, on the first day of their appearance they occasionally bore so close resemblance to the rose spots, that although they were never altogether identical with the best marked specimens of the latter, yet the most tutored eye might be in some doubt as to which order they belonged; and when the general symptoms were at the same time equivocal, the diagnosis was impossible till a day or two had elapsed, when some or all the spots passed into their second stage; whereas, if they had been the spots peculiar to the typhoid fever, they would have retained the characters they presented on the first day, till they disappeared altogether on the third or fourth day after their eruption.

1	was first seen on the 6th day of disease.	1	was first seen on about the 5th day of disease.
2	were ...	7th	...
5	... ...	8th	...
5	... ...	9th	...
5	... ...	10th	...
1	... ...	12th	...
1	... ...	13th	...
1	... ...	15th	...
			8th ...
			9th ...
			10th ...
			15th ...

And in twelve cases it was uncertain how long the disease had existed prior to the presence of the rash being noted.

In eleven of the forty-three cases, the eruption disappeared before death, a mere trace of the spots only existing in four cases on the 14th day, in two on the 20th, and in one there was no trace of the spots on the 24th day, no note of their condition having been taken for some days preceding; these seven patients were first seen on the 7th, 8th, 9th, 9th, 10th, and 15th days of the disease, the eruption being present on all at these times.

The four patients from whom the rash disappeared on the 14th day, died on the 23d, 24th, 32d, and 148th days, after the first symptoms of fever showed themselves. Of these the first died of asthenic laryngitis; the second of phlebitis, which began after the patient had left his bed and was considered convalescent; the third of smallpox, caught during convalescence; and the fourth of erysipelas, sloughing of the back, and pneumonia. The diseases that caused death in the first and last, supervened during the progress of the fever, and continued after that had run its course.

Of the three patients from whom the rash disappeared on the 20th, and before the 24th days of the disease, the two former died on the 22d and 29th days of circumscribed gangrene of the lung, and of sloughing abscess and pleuro-pneumonia; and the third on the 44th day, of gangrenous abscess of the lung. These fatal complications also arose during the course of the primary disease, and caused the patients' death some time after the specific fever had terminated. It was uncertain how long the disease had existed prior to the admission of the remaining four patients (*i.e.* of the eleven from whom the eruption disappeared before death), but a mere trace only of the spots was to be seen on the 8th, 9th, 9th, and 13th days of their residence in the hospital, the patients dying on the 11th, 12th, 30th, and 16th days respectively, of pus in the joints, cerebral congestion, pleuro-pneumonia, and erysipelas; all commencing before the fever had finished its course, and continuing and proving fatal to the patient after its termination.

In one case, some difficulty was experienced in determining the nature of the spots, *i.e.* whether they were true typhus spots; they were in fact so imperfectly marked, that the diagnosis between typhus and typhoid fever could not in this case have been positively formed from the eruption alone.

In the remaining thirty-one cases, the rash was distinctly visible

till death. In four of these cases, it became somewhat paler the last two or three days of life; in four others, no note of its condition was made for a day or two before the fatal termination—these eight patients survived beyond the 14th day of the disease; in twenty-three of these thirty-one cases, the rash continued to grow darker, and to be less affected by pressure, till death.

Of the thirty-one cases in which the mulberry rash was distinctly visible till death—

1 died on the 10th day of the disease.	1 died on about the 9th day of disease
2 ... 11th	1 ... 11th
2 ... 12th	1 ... 13th
3 ... 13th	1 ... 15th
3 ... 14th	1 ... 16th
1 ... 15th	2 ... 17th
2 ... 16th	
2 ... 17th	
1 ... 19th	
1 ... 20th	

The date of the disease on admission in six cases was entirely unknown; two of the six died on the third day of their residence in the hospital, the other four respectively on the 4th, 6th, 7th, and 8th days. To sum up,—

1. The mulberry rash was present in all the cases.
2. The rash usually appeared from the 5th to the 8th day of the disease.¹
3. Fresh spots never appeared after the 2d or 3d days of the eruption.
4. The duration of each spot was from its first appearance till the death or recovery of the patient from the attack of typhus.
5. The rash disappeared between the 14th and 21st days of the disease; when death ensued after the latter date, it was the result of local disease, which either complicated the progress of the fever, and continued after that had run its course, or sprung up anew, connected or not with the enfeebled state of constitution, the consequence of the fever.
6. In no case was there any return of the eruption, and therefore no *true relapse*.

MILIARY VESICLES—HYGROMETRIC AND THERMOMETRIC CONDITIONS OF THE SKIN.

Typhoid Fever.—Miliary vesicles were noted to be present during life in three of the twenty-three cases here analyzed. In one they appeared on the 84th day of the disease,² and continued till the

¹ See note, p. 14.

² From the calculation made, when treating of the duration of the two diseases, it appeared probable that I had ascertained very nearly the date of the disease on which those said to have been admitted on about a given day of the

death of the patient on the 27th day; in one of the three there were none present on the 9th day, but a great number were observed on the 11th, and continued till the 14th or 15th, the patient dying on the 25th day; in the third case there was an abundant crop on the 26th day. In all the three cases they were preceded and accompanied by a warm skin and profuse sweating.

In four of the remaining twenty cases miliary vesicles were detected after death; two of the four sweated profusely just before death; the condition of the skin in the other two at that time was not recorded. Therefore seven of the twenty-three had miliary vesicles—*i. e.*, in the proportion of 30·4 per cent., or nearly one-third.

The skin during the first week of the disease was hot and dry in two cases, warm and perspiring in one case. None of these cases were seen before the 4th day of the disease.

During the second week it was hot and dry in one case; hot and sweating in three; cool or cold in one.

During the third week it was hot and dry in three cases; hot and sweating in one; warm and dry in two; cool and dry in five cases.

During the fourth week it was hot and dry in three cases; hot and sweating in one; warm and dry in two; and warm and sweating in one case.

The variations in the temperature of the skin in the same patient were considerable; and in several instances where the typhoid fever was prolonged, these changes were observed to have no relation to the duration of the disease. Thus the skin hot on the 8th day was in one case warm on the 9th, hot on the 10th, warm on the 11th, 12th, and 14th, and again hot the six or seven succeeding days. And the same want of relation existed between the sweats and the duration of the disease. Thus in the case last referred to the patient perspired during the 10th, 12th, 13th, and 14th nights—the skin having been dry during the days; on the 17th day the skin was moist; while on the 15th, 16th, 18th, and 22d, there were no sweats either at night or during the day.

Typhus Fever.—Miliary vesicles were observed during life in two of the forty-three cases. In one the hygrometric condition of the skin was not noted at the time of their appearance—viz., the 12th day of the disease; they had disappeared before the patient was seen on the 16th day—the skin having been cool and dry the preceding day. This patient survived till the 148th day from the commencement of illness. In the other case the skin, hot and dry on the 11th day, was sweating profusely on the 12th and 13th—on neither of which days were any miliary vesicles present; but on the 14th day there

disease were received into the hospital. I shall, therefore, henceforth, make no distinction between the two groups, but speak of all as admitted or seen on a given day of the disease.

were a few in the groin and under the clavicles. This patient died on the 15th day of the disease.

There were no miliary vesicles in eleven cases. The skin in three of the eleven perspired profusely; in one it was cool, in five warm and dry; and in two it was hot and dry.

No note of the presence or absence of miliary vesicles was made during life in the remaining thirty cases; but in three of the thirty some were discovered after death. The hygrometric state of the skin, which existed for some time before the fatal termination, was not recorded in these three cases.

During the first week of the disease the skin was hot and dry in two cases, and warm and dry in four—none of them being seen before the 5th day.

During the second week it was hot in seven cases, two of which sweated profusely, one on the 15th, and the other on the 13th and 14th days; it was warm and dry in fourteen cases, two of which sweated profusely on respectively the 9th and 10th day; it was cool in twelve cases, two of which perspired freely on the 15th day of the disease.

The profuse perspirations in the above six cases preceded the fatal termination one or two days, and continued till death.

During the third week of the disease the skin was warm and dry in one case, which survived till the 148th day of illness, and cool in three cases. After the temperature began to fall, it was exceedingly rare for it to rise again, unless the illness was prolonged by local disease beyond the termination of the typhus fever.

It is remarkable that of the five patients who sweated profusely, and on whom, nevertheless, no miliary vesicles were detected, four were more than forty years old, their mean age being fifty-five years; while the five patients on whose skin miliary vesicles were detected, either during life or after death, were all under forty, their mean age being thirty-one years.

Seventeen of the forty-three patients who laboured under typhus fever, and whose cases we are examining, were under forty years of age; five of the seventeen—*i. e.*, in the proportion of 29·4 per cent.—had, as I have stated, miliary vesicles on their surface, either detected during life or discovered after death.

Twenty-six of the forty-three patients labouring under typhus fever were forty years of age and upwards; but on not one of these was a vesicle detected.

EXPRESSION—MANNER—HUE OF FACE, ETC.

Typhoid Fever.—The expression in two cases was nearly natural throughout the whole course of the disease.

In the majority of the cases here examined it was oppressed, heavy, and somewhat anxious; the expression of heaviness and prostration was, however, far less marked than in the cases of typhus

fever; and in two patients, while delirious, the expression was highly vivacious.

The natural hue of the face—*i. e.*, of the skin of the whole face—was unchanged, excepting in three cases, in which it had a very slightly marked dusky appearance.

There was no flush in three, and no note made of its presence in eight cases.

In twelve of the twenty-three cases the face was flushed; in eleven of the twelve the flush was pink, and limited to one or both cheeks; it varied in intensity, disappeared, and returned occasionally, in the same day.

This limitation of the flush to the cheeks was not peculiar to any one period of the disease; it was well marked in one case, when admitted on the 8th day of the disease, and continued so till the 23d day, the patient dying on the 25th. In another, admitted on the 5th day, there was a circumscribed flush on the cheeks on the 7th day, which continued with little change till the 15th day, the patient dying on the 17th day.

This flush when conjoined, as it sometimes was, with extreme emaciation, sunken eyes, large pupils, quick breathing, sharp and somewhat anxious manner, forcibly recalled to the mind cases, not of typhus fever, but of phthisis.

Typhus Fever.—In none of the forty-three cases was the expression natural throughout the disease.

In a large majority of the cases both the expression and the manner of the patient were so peculiar, that from them alone the diagnosis might have been formed. They were dull, heavy, oppressed, confused, like those of a drunken man just disturbed from sleep. The mind was rarely intelligent enough after the commencement of the second week to be disturbed as to the final issue; and, as the disease in itself is free from serious organic lesion, all automatic as well as mental expression of anxiety was absent.

The hue of the face, after about the 6th day was, like the expression and manner, peculiar—it was thick and *muddy* looking; the change from this condition to the clearness of health was most remarkable—it was well seen in the patient who recovered from the attack of fever and died of small-pox, before referred to.

This muddy hue had no relation to the flush of the face, for it was often present when the face was pale; moreover, though only noted in the face, it affected more or less the whole skin.

The face was flushed in eighteen cases, and in every case the flush covered the whole face, though in some it might have been somewhat more intense on the cheek than elsewhere.

The colour of the face when flushed was dusky red, and never pink as the cheeks were in the cases of typhoid fever.

In some cases the face was recorded to be pale throughout the disease. Its condition in the other cases was not noted.

HEADACHE.

Typhoid Fever.—In two cases, the histories of which were complete, and the duration of the disease lengthened, there was no headache.

In twelve cases, headache was one of the earliest symptoms; in five of these it disappeared respectively on about the 6th, 13th, 13th, 17th, and 17th day of the disease; in six, before they came under observation, severally on the 15th, 16th, 18th, 21st, 21st, and 28th day. In one case there was a little headache on the 14th day; but, from the subsequent mental confusion of the patient, it was uncertain when it ceased.

Of the previous histories of nine cases, with respect to the point we are investigating, no particulars could be obtained; but in three there was no headache on the 15th, 21st, and 21st day; in one there was only trifling headache on the 15th day; the state of mind in the remaining five was such when they entered the hospital, that I could not ascertain if headache existed at that time.

Thus headache was in a large majority of cases one of the earliest symptoms of these cases of typhoid fever; and in the majority of them it disappeared spontaneously at the latter end of the second, or during the third week of the disease.

The pain was generally seated in the forehead, and never in the occiput. It varied much in degree, some patients complaining of it severely, others scarcely noticing it. It had no definite character—*i. e.*, the patients could rarely give it any name, as darting, bursting, &c.

Typhus Fever.—In two cases there was no headache.

In nineteen cases it was one of the earliest symptoms, and, in the majority, commenced the first or second day of the disease; in four of the nineteen it disappeared respectively on the 8th, 9th, 11th, and 12th day; in seven there was no headache present when the cases were severally taken on the 8th, 9th, 9th, 10th, 10th, 13th, and 14th day; in three others it was still very severe respectively on the 6th, 7th, and 9th day; in the remaining five of the nineteen there was so much mental confusion or actual delirium present when the patients came under observation, that no dependence could be placed on their answers to questions regarding their sensations; the fact of the existence of headache at an early period of the disease was in these cases obtained from the friends of the patients. In three cases, the histories of which were doubtful, the headache was trifling when they were first seen severally on the 8th, 8th, and 9th day; it had disappeared in all the three on the 10th day.

Of five patients in whom the duration of the disease before their admission into the hospital was unknown, and the histories of whose cases were uncertain, four had some headache when first seen; the fifth was at that time free from pain in the head.

No dependence could be placed on the replies of fourteen of the forty-three patients to questions regarding their sensations, in consequence of their mental confusion ; but none of the fourteen while in the hospital complained of headache.

So that headache was one of the earliest symptoms in a large majority of the cases, and it usually disappeared spontaneously by the 10th day of the disease, and in every case before the termination of the second week.

The seat of the pain was generally the forehead, very rarely the vertex or temples, and in no case the occiput. It varied much in severity, was often extremely intense, but was sometimes so trifling, that unless inquiries had been made of the patients, they would not have mentioned it.

It was usually an undefinable pain, not to be characterised by such terms as stabbing, throbbing, &c.

DELIRIUM.

Typhoid Fever.—There was no delirium in three cases, but in one of the three there was considerable mental confusion.

Delirium was present in twenty cases ; in ten of the twenty it began severally on the 3rd, 6th, 6th, 10th, 14th, 15th, 23rd, 26th, 28th, and 29th day ; seven were delirious when first seen between the 13th and 21st days inclusive ; in the remaining three of the twenty cases it was uncertain at what date of the disease the delirium set in.

The delirium continued till death in nine cases ; in eight of these the fatal termination occurred on the 12th, 17th, 17th, 21st, 25th, 27th, 30th, and 30th day of the disease ; in one of the nine the duration of the disease at the time of the patient's death was unknown.

In one case, which proved fatal on the 23rd day, there was no delirium after the 21st day, from which time till her death the patient lay in a state of profound stupor.

The delirium usually first showed itself at night, the patients sleeping during part of the day. It varied much in amount, sometimes being so violent that the patients left their beds, and even ran screaming through the wards ; at others showing itself by slight delusions only discovered to exist by accident, or again by almost constant chattering.

Ten of eighteen patients—*i. e.*, more than one-half, or in the proportion of 55.5 per cent. of those who were delirious after they entered the hospital, and of whom notes on the point were made—left their beds to wander about the ward.

Typhus Fever.—The mind of one patient of the forty-three, whose cases I am here examining, was perfect throughout the disease. This was a very mild case in every particular ; the patient died of phlebitis after he had once left his bed. In another case there was only slight mental confusion ; this patient also survived the fever.

Although there was no actual delirium in thirteen other cases, yet there was in them such extreme mental confusion that the patients could give no account of their past state, "felt bothered," had no idea how long they had been in the hospital, nor in some cases where they were.

Delirium began in ten cases respectively on the 5th, 8th, 10th, 10th, 10th, 11th, 11th, 11th, 12th, and 13th day. It was present when five cases first came under observation, severally on the 6th, 8th, 9th, 9th, and 14th day.

In every instance in which the delirium commenced after the patients entered the hospital, excepting one, it was preceded by a varying amount of mental confusion.

It was uncertain how long nine patients had been ill, who were delirious when I first saw them. Four patients were admitted into the wards in a state of complete stupor. The delirium continued till the death of the patients in thirteen cases, nine of which proved fatal severally on the 9th, 11th, 11th, 14th, 16th, 17th, 17th, 19th, and 20th day. The remainder of the forty-three patients either sunk into a state of absolute coma, or survived the termination of the fever.

The character of the delirium was usually far less active than that of the delirium of typhoid fever, the patients displayed less vivacity, and fewer of them, seven only of the twenty-four, *i.e.*, at the rate of 29·2 per cent. of those who were delirious after they were admitted into the hospital, attempted to leave their beds to roam in the wards.

SOMNOLENCE.—COMA VIGIL.

Typhoid Fever.—There was no somnolence in twelve cases; one of these proved fatal after the patient had been ill an uncertain time; eleven on the 12th, 17th, 17th, 21st, 25th, 25th, 27th, 30th, 32d, 46th, and 86th day after the illness commenced. These eleven being seen for the first time respectively on the 5th, 6th, 15th, 14th, 7th, 11th, 20th, 28th, 18th, 16th, and 9th day.

Somnolence was observed in eleven cases; of three of these I have no notes to show when it ceased, but it was profound when one was admitted on the 6th day; in four cases which proved fatal after the termination of the fever, somnolence began on the 15th, 22nd, 25th, and 26th day, and ceased on the 19th, 28th, 31st and 27th day, the patients dying respectively on the 44th, 71st, 34th, and 46th day; in three cases somnolence commenced on the 14th, 23rd, and 27th day, and continued till the death of the patients severally on the 23rd, 28th, and 30th day; one patient was somnolent when the case was taken on the 15th day; continued so till the 23rd, and died on the 33rd of pleuro-pneumonia.

The intensity of the somnolence varied from mere drowsiness to profound stupor. I have not included among the cases affected with somnolence, those of the patients who slept during a portion of the day, but who had been awake a great part of the night. *Coma Vigil*, as described under the head typhus, was not present in a single case.

Typhus Fever.—There was no somnolence in sixteen cases; six of these survived the fever. The duration of the disease prior to the admission of four of the sixteen cases, was unable to be ascertained. The remaining twelve were admitted into the hospital, one on the 6th, four on the 7th, four on the 8th, one on the 9th, one on the 12th, and one on the 14th day of the disease, and (those that lived after the termination of the fever being omitted) died, one each on the 10th, 11th, 12th, and 14th days, and three on the 16th day.

Somnolence occurred in twenty-seven cases; in eleven of them on the 7th, 10th, 9th, 11th, 11th, 12th, 12th, 12th, 13th, and 13th day; in seven before the 10th, 10th, 13th, 14th, 14th, 14th, and 15th day.

It continued in twenty cases till death, which in eleven of the twenty happened during the latter part of the second week, *i.e.*, from the 9th to the 14th day inclusive; in four during the third week, *i.e.*, between the 15th and 20th day; in five of the twenty cases the duration of the disease was unknown. In three cases the somnolence terminated in coma vigil.

Coma Vigil.—By this term I intend to express that peculiar condition in which the patient lies with his eyes open, evidently awake, but indifferent or insensible to all going on around him, and not what some writers on fever have meant by the expression, *viz.*, that state in which a patient lies asleep for hours, and yet declares on awaking that he has never closed his eyes.

Nine patients, or more than one fifth of the forty-three patients experienced coma vigil (as I have above defined the expression) from one to four days immediately preceding their death. These nine cases terminated fatally on from the 10th to the 19th day, and in two cases at an uncertain period of the disease.

RELATION BETWEEN HEADACHE, DELIRIUM, SOMNOLENCE, AND COMA VIGIL.

Typhoid Fever.—The two patients who from the outset of the disease were free from headache, had violent and long-continued delirium, but were up to the time of their death exempt from somnolence.

In two cases only was there any headache after delirium commenced.

One patient, who died after the termination of the fever, was violently delirious on his admission on the 15th day of the disease, and profoundly comatose on the 16th; another, delirious and sleeping less than natural on his admission on the 15th day, continued in the same state till the 26th day, when he became very drowsy and remained so for twenty-four hours, after recovering from this slight somnolence he slept tolerably well till his death, on the forty-sixth day from the commencement of his illness.

The delirium continued after the somnolence began in all the

cases, and did not disappear till the death of the patient, unless the somnolence passed into coma.

In one case the delirium was considerable and long-continued, the somnolence trifling.

There was headache in one case, in the course of which there was neither somnolence nor delirium.

Typhus Fever.—Of the two patients whose histories rendered it probable that they had no headache, even from the outset of the disease, and certainly they could have had but little, one suffered from violent delirium, and the other from somnolence terminating in coma vigil.

The headache disappeared before the delirium began in every case in which the latter commenced after the patient's entrance into the hospital.

Of ten cases accurate information was obtained respecting the date of the commencement of somnolence and delirium; in nine of the ten the delirium preceded the somnolence, in one only did the somnolence precede the delirium.

Delirium was unaccompanied by somnolence in five cases, but two of these had coma vigil. Somnolence without actual delirium occurred in six cases; coma vigil without delirium in three; somnolence and delirium conjoined in nineteen cases.

Delirium preceded coma vigil in five cases, the delirium in one being accompanied by somnolence; this peculiar condition was preceded by somnolence without delirium in one ease, mental confusion not amounting to actual delirium preceded it in two cases, and it was present when one case entered the hospital.

SPASMODIC MOVEMENTS.

Typhoid Fever.—Spasmodic twitchings of the muscles of the face or arms occurred in six of twenty-one cases; picking of the bed-clothes in two. In no ease were there general convulsions.

Typhus Fever.—Involuntary catchings of the muscles of the face, arms, or hands, were observed in twelve cases. In two of these the spasmodic action of the inferior recti muscles of the eyes, and of the levatores palpebrarum gave to the countenance a most remarkable aspect; the spasmodic movements were in both cases excited at any moment by suddenly raising either arm—the patients at the time appeared totally insensible to all going on around.

Two patients suffered from general convulsions; in both cases they were repeated twice, at intervals of one and three days.

RETENTION OF URINE, AND INVOLUNTARY DISCHARGE OF URINE AND STOOLS.

Typhoid Fever.—The urine was retained in one case only, and the catheter had to be introduced for its removal on the 23d day of the disease.

The urine was passed involuntarily in ten cases; for the first time on from the 9th to the 27th day of the disease. Thus about one-half of the cases experienced involuntary discharge or retention of urine. Ten patients passed stools into the bed; this symptom was noted to be present for the first time on from the 13th to the 35th day of the disease. With one exception the urine was passed involuntarily into the bed at the same time as the stools.

Typhus Fever.—The urine was retained, and required the use of the catheter for its removal in eleven of the forty-three cases. The retention first occurred between the 10th and 21st days inclusive, and with two exceptions between the 10th and 16th days inclusive. It was passed involuntarily in twelve cases—this first took place on from the 8th to the 20th day; in two cases the retention of urine was preceded for a day by its involuntary discharge. Either retention or involuntary discharge of urine was a symptom in twenty-one or in nearly one-half of the patients; and as no notes on the point were taken in seven cases in which the prostration was extreme, it is probable that considerably more than one-half were thus affected.

The stools were passed involuntarily in seventeen cases; the day of the disease on which this symptom first occurred was from the 8th to the 21st; it was in every case accompanied by an involuntary discharge of urine.

LOSS OF MUSCULAR POWER AFTER THE PATIENT'S ADMISSION INTO THE HOSPITAL.

Typhoid Fever.—Two patients were able to leave their beds unassisted and with facility throughout the whole course of the disease. One of these patients died on the 25th day of the disease, and the other five weeks after her admission.

Two were able to leave their beds with tolerable facility respectively up to the 15th and 24th day of the disease, but the former on the 16th and the latter on the 26th day, were unable, without assistance, to reach the close stool placed immediately adjoining the bed.

Five patients could, though with great difficulty, get out of bed unassisted, from the 13th to the 30th days, while ten were quite unable from the 5th to the 26th days; there was extreme prostration in eight cases from the 14th to the 30th days.

Of four patients my notes were incomplete.

Two others were admitted in a state of extreme prostration after the disease had lasted an uncertain period.

Typhus Fever.—One patient only could leave his bed with tolerable facility through the whole course of the disease; this was a very mild ease in every respect, and the patient died of phlebitis some time after convalescence from the fever; two with difficulty from their admission on the 8th and 7th day of the disease, till the death of one on the 14th, and the recovery of the other, who eventually died of smallpox.

Twelve patients were unable to leave their beds unassisted from the 6th to the 14th day.

In thirty-four cases the prostration was extreme ; in a large majority of these cases the prostration became extreme between the 9th and the 12th days. In one case the patient, though able to get out of bed unassisted, with difficulty, on the 5th day of the disease, was quite unable to leave her bed unassisted on the 6th, and on the 9th day was in a state of extreme prostration. In one case only the prostration was not extreme till as late as the 17th day of the disease.

Nine cases were at the time of their admission into the hospital in a state of extreme prostration ; the duration of the disease, prior to the time they came under observation, being unknown.

SYMPTOMS FURNISHED BY THE ORGANS OF THE SENSES.

Typhoid Fever.—Epistaxis occurred in one third of the cases, or in five of fifteen, the particulars of which were obtained from the commencement of the disease ; in neither of them was it excessive, and in one case only a few drops of blood were lost. The hemorrhage took place in these five cases respectively on the 4th, 8th, 11th, 12th, and 12th day ; it was repeated in the last on the 14th day.

In six cases it was not known whether epistaxis had taken place prior to the patients' admission into the hospital, which in four of the six was on the 6th, 13th, 14th, and 21st day, and in two at an undetermined period of the disease.

Hearing.—Almost a fourth, or six of the twenty-three patients had deafness more or less complete after they entered the hospital ; and three tinnitus aurium ; one of these three subsequently became deaf. The difficulty in hearing made its appearance on from the 12th to the 25th day.

Eyes.—The conjunctivæ were injected in three cases, and in one of the three continued so from the time the patient was first seen, i.e., the 13th day of the disease, till the fatal termination on the 23rd day ; the other two came under observation between the 21st and 27th days. In one case they were injected when the patient was first seen on the 9th day of the disease, but on the 11th day they were pale. In ten other cases the conjunctivæ were noted to be pale, the patients being under observation repeatedly at different periods of the disease ; one of these ten cases was seen as early as the 5th, and one as late as the 30th day.

In two cases only were the pupils of the eyes noted to be smaller than natural, while in seven cases they were decidedly dilated ; the pupils of the eyes in two patients, first observed on the 5th and 14th days of the disease, were respectively at those dates noted to be normal in size, but on the 8th and 22d day respectively, they were larger than natural.

The exact day of the disease on which they were first observed to

be greatly dilated, varied in six cases, respecting which notes on the point were taken, from the 8th to the 22d day; a seventh case came under observation after the fever had continued an uncertain time.

Typhus Fever.—Epistaxis.—There was not a single instance of bleeding from the nose in twenty-three cases, the particulars of which, before they entered the hospital, were obtained; nor did one of the forty-three patients, whose cases we are examining, suffer from epistaxis after their admission into the hospital.

Hearing.—Nine, or rather more than a fifth of the forty-three patients labouring under typhus, had more or less complete deafness as a consequence of the fever, and one tinnitus aurium.

The difficulty of hearing was first observed from the 10th to the 13th day of the disease.

Eyes.—The conjunctivæ were more or less intensely injected in twenty-five cases; and in all of those in which the opportunity occurred of observing the date of the first appearance of this increased vascularity, it began during the second week. In one case only, seen during the first week, were they injected at that time; in eleven of the twenty-five cases in which the conjunctivæ were more vascular than natural, the pupils were contracted.

THE TONGUE.

Typhoid Fever.—Notes respecting the physical condition of the tongue were made in twenty of the twenty-three cases here considered.

In six, it was moist during the whole time the patients were under observation, or respectively from the 10th, 11th, 12th, 15th, 18th, and 20th day, till their death; four of them dying between the 15th and 30th days, and two some time after the latter date. In four of these six cases, it was clean or slightly furred, neither of the four dying before the 24th day of the disease; in the fifth it was brown and furred, and in the sixth yellow and furred.

In another case, first seen on the 20th day, and which proved fatal on the 27th day, the tongue, with the exception of the 25th day, when it was dry in the centre, was moist throughout the disease.

So that the tongue may be said to have been moist during the whole course of the disease in a third of the cases in which its condition in that respect was noted.

In twelve cases the tongue was entirely or partially dry and brown, at some period of the disease; in two, however, the hue never exceeded in depth a pale yellow brown; in six, it could never be said to be dark brown; while in two it was almost black, one of the two, however, was at the time suffering from extensive gangrene of one lower extremity.

In about one-third of the cases, *i.e.*, seven of the twenty, it was more or less red; in one-fourth glazed entirely or partially: and

in one-fifth of the twenty it was deeply fissured at some period of the disease.

In one ease only was the patient unable to protrude the tongue when directed to do so.

There was no regularity in the order of the succession of these various conditions of the organ; thus, in one case seen on the 8th day, it was at that time covered with a thick layer of brown mucus, and rather moist; on the 9th and 10th days it was partially covered with yellowish brown flakes and fissured; on the 11th day moist, and covered with a thick white fur; on the 12th and 14th days it resumed the appearance it presented on the 9th and 11th days; on the 15th day it was again moist and white; on the 16th it presented a dry centre; on the 17th, 18th, and 19th days, it was pale brown over its whole surface, and fissured in the centre, while on the 22d day its centre only was pale brown, its edges being white, on which day the last note of the tongue was made; the patient died on the 25th day of the disease.

Typhus Fever.—The varying physical conditions of the tongue were recorded in forty-one of the forty-three cases here analyzed.

In one only was it moist during the whole time it was under observation; the patient, a female child, aged ten years, was first seen on the 15th day of the disease, the tongue being then moist and white; from the 18th to the 21st day it was moist and partially brown; the child eventually died from gangrenous tubercular abscesses of the lung.

It was moist in ten cases when first seen on from the 8th to the 11th day, but grew darker as the disease advanced.

The tongue in thirty cases was dry when first under observation; the day of the disease on which twenty of the thirty were seen varied from the 6th to the 18th day; of the other ten, no history to determine the date of the disease could be obtained.

It was moist and slightly furred in a patient seen on the 9th day, dry and slightly furred in the same patient on the 10th, 11th, and 12th days; this was a very mild case, in which the fatal termination was caused by phlebitis.

In thirty-three cases the tongue was completely dry and dark-brown at some period of the disease.

The patients, in whom it was dry and brown when they were first seen, and the date of whose disease on their admission was exactly or approximatively ascertained, came under observation from the 6th to the 13th day.

It was moist and loaded in three patients on their admission the 8th, 8th, and 9th day of the disease, and became dry and brown in these three cases, respectively on the 10th, 10th, and 12th day.

In four only of the forty-one cases, or about one-tenth, was the tongue fissured, and in five only, or about one-eighth was there any redness of the organ. One-fifth of the patients were unable to protrude the tongue at some period of the disease.

ABDOMINAL PAIN, TENDERNESS AND PHYSICAL SIGNS.

Typhoid Fever.—Of eleven patients, respecting whose condition previous to their admission into the hospital, pretty accurate histories with reference to the point were obtained, five, or nearly one-half suffered pain in the abdomen, as one of the earliest symptoms of the outset of the disease.

Six of twenty-one patients, of whom notes on the point were made, suffered from pain in the abdomen after their admission into the hospital; these patients were received into the wards between the 8th and 16th day of the disease; in one case only was any pain complained of in the fourth week.

No tenderness existed in five cases while they were under observation, respectively from the 5th, 15th, 19th, and 21st day, till the 12th, 27th, 28th, and in two cases until after the 30th day.

Tenderness of the abdomen was present in three-fourths, or in fifteen of twenty cases, respecting which notes on the point we are considering were made.

In one of the fifteen, however, it did not arise till peritonitis, the consequence of perforation, had taken place.

The tenderness was sometimes limited to the right iliac fossa, and though frequently extreme, was occasionally trifling.

Gurgling, generally situated in the right iliac fossa, was present in five cases, or nearly a fourth; the bowels being relaxed in every one of the five cases.

The abdomen was full in three cases, resonant in five, full and resonant in ten cases. In one instance only did it preserve its normal form, and afford a natural percussion note. The size of the abdomen was often extreme, but whether much or little distended, its shape was invariably the same, and somewhat peculiar; its convexity was from side to side, and not from above downward; the patient was never "pot-bellied," but tub-shaped. The cause probably was, that the flatus chiefly occupied the colon ascending, descending, and transverse.

Typhus Fever.—One only out of twenty cases, of which histories on the point were obtained, had suffered pain in the abdomen among the first symptoms of the disease; this was a female, aged fifty-six, in whom the catamenia had for some time appeared at irregular intervals; she fainted suddenly nine days before her entrance into the hospital, and on recovery experienced severe headache and pain in the abdomen; on the following day the catamenia flowed freely, and all pain in the abdomen vanished.

Another admitted on the 8th day of the disease, had experienced gripping pains in the abdomen from the 5th to the 7th day; there was no return of the pain in either case after admission.

Two patients, after they were received into the hospital, suffered from slight pain in the abdomen, respectively on the 8th and 9th day of the disease.

There was trifling tenderness of the abdomen in five of twenty-six cases seen during the second week of the disease; in two others there was tenderness at an uncertain period of the disease.

Of nine patients under observation, during the third week of the disease, and of whom notes were made with reference to the subject, one only experienced any tenderness of the abdomen.

Tenderness of the abdomen was then present at some period of the disease in nine cases, but in eight of them it was trivial and transient; in the ninth it was more decided, commenced gradually on the 12th day, and continued till the fatal termination on the 20th day; it was limited almost entirely to the hypogastric region. The subject of this anomaly suffered from retention of urine, and after death there was found minute capillary injection of the mucous membrane of the bladder, more marked on its anterior than on its posterior surface.

Gurgling was detected in one case only, and in that there existed at the time considerable diarrhoea.

The abdomen in twelve of forty-one cases, of which notes on the point were made, was full and resonant; in three only of these twelve cases was it unnaturally distended, and in neither of the three was it noted to possess the peculiar shape of the typhoid abdomen.

In twenty-two cases there was neither fulness, resonance, tenderness, nor gurgling; in these twenty-two cases the abdomen presented all the physical signs of health, and in two of them it was noted to be somewhat concave.

DISCHARGES FROM THE BOWELS.

Typhoid Fever.—Particulars were obtained from the patients or their friends, regarding the condition of the bowels before admission into the hospital, of sixteen of the twenty-three cases.

In two of the sixteen the bowels were confined, the patients being admitted respectively on the 9th and 15th day of the disease; in four, confined till after a dose of aperient medicine, from the moment of the action of which diarrhoea set in (these four were admitted into the hospital respectively on the 8th, 8th, 12th, and 29th day); in two cases which came under observation on the 4th and 13th day, the bowels were stated to have been regular up to those dates, one stool only having been passed daily.

The bowels were much relaxed before the admission of the remaining eight cases, in the majority from the outset of the disease, and in all before the administration of aperients.

The condition of the bowels was recorded frequently after the admission into the hospital of twenty-one of the twenty-three cases.

Of these twenty-one, two only needed aperients, one a single dose of castor oil, the second repeated doses of that and other aperients, while one case in the first week of the disease, three in the second, two in the third, and six during the fourth week, required the re-

peated exhibition of opiates to restrain diarrhoea. Of two patients seen during the first week of the disease, one passed from two to six watery stools daily, the other from three to four.

In the second week the number of stools passed each day varied from one to four. Of seven patients under observation during this time, five passed as many as three stools each, and one four stools in twenty-four hours. Of fourteen patients of whom notes were taken during the third week of the disease, nine passed three stools each, and two as many as four and six in one day, while in the fourth week fourteen out of fifteen patients passed three stools each on one day, and ten of fifteen from four to six stools. From the above calculations I have excluded the two cases which required an aperient after they came under observation. One of these, a male aged twenty-eight, entered the hospital on the 10th day of the disease. His bowels had been confined from the first, and for the twenty-four hours succeeding his admission he passed no stool; half an ounce of castor oil was given; on the following day he had three stools, on the 13th day two, on the 16th day he passed no stool, and from that time the bowels continued regular till the 25th day of the disease, when the patient died of profuse hemorrhage from the bowels. The other case was that of a female who entered the hospital on about the 15th day of the disease, but who had been under my observation for some days preceding her admission. From the first her bowels had been confined. On the 16th day she passed one stool, on the following day none, she then had half an ounce of castor oil, which acted three times; from this time till the 25th day, she scarcely had a stool without the aid of aperients. On the 28th she seemed nearly well, her bowels were quite regular, and she left her bed. On the 36th day she was suddenly seized with severe pain in the abdomen, took an aperient on the 37th day, and on the 38th passed four dark solid lumpy stools, on the 40th four equally solid stools; from this time she had one or more scanty solid stools till her death on the 46th day, from extensive ulceration and perforation of the agminated glands at the lower part of the ilium.

The consistence of the stools was watery in twelve cases at some period of the disease, and soft, pultaceous, or almost fluid in four others.

In eight cases only were stools of natural consistence passed after the patients came under observation, and in five of these the stools were watery during some period of the disease. Their colour varied from pale brown to almost black; when watery they were usually pale yellowish brown, with a sediment composed of small solid yellowish particles.

Seven out of twenty-one patients, particulars respecting whose stools were recorded, passed blood from the bowels. In one, discharges of blood took place on the 6th and 7th day of the disease. On the tenth the stools were healthy in appearance, and well formed. And although they afterwards became watery, there was no return

of the hemorrhage. One man passed a small quantity of blood on the 8th, 9th, and 10th days of the disease, and again from the 28th to the 32nd—*i. e.*, the day of death—the stools between the two attacks of hemorrhage being watery, but free from blood. In one case blood was mixed or passed with every stool from the 14th to the 21st day, the patient dying on the 25th day.

In four cases hemorrhage from the bowels occurred during the last day or two of life, the patients dying respectively on the 17th, 23rd, 25th, and 28th day of the disease.

The blood lost varied in quantity from an ounce or two, to two or three pints; in hue from black to bright red; and in consistence, from a reddish watery fluid to the consistence of treacle, and even solid clots.

Typhus Fever.—The bowels were stated to have been more or less confined from the commencement of the disease till the admission of the patients, in ten out of nineteen cases, the histories of which were obtained with as much accuracy as possible; in six of these nineteen cases they were regular from the first; five of the nineteen had taken one or more powerful doses of aperients, without producing any diarrhoea; three only of the nineteen had diarrhoea before their entrance into the hospital, and in two of the three it supervened after the use of aperient medicine; these nineteen cases were admitted between the 5th and the 12th days of the disease. Notes were taken of the condition of the bowels in the whole of the forty-three cases after the patient's admission into the hospital. Twenty-two needed while under observation the use of from one to four doses of aperient medicine, while in one case only was an opiate required for the purpose of checking diarrhoea.

In two of the four patients seen during the first week of the disease, the bowels were confined till an aperient was administered; and in neither of the other two did the number of stools passed in any one day exceed two.

Of ten patients seen during the second week who took no aperient, four only passed more than two stools on any one day; but one of these two had severe diarrhoea, passing from four to six watery stools daily.

Of nine patients under treatment during the third week, four required the use of aperient medicine, and in one only was there any diarrhoea.

Two of eleven patients admitted after the disease had lasted an uncertain time, required the use of aperients, and in one case only of the eleven was diarrhoea present; but in this case it was very severe, from two to six stools being evacuated daily for nearly a fortnight.

The consistence of the stools was noted in seventeen cases: in two only were they watery, in eight they were pulaceous, in seven solid. No note was made of their consistence in twenty-six cases; but in fourteen of these twenty-six aperients were required: so that in

these the stools were at least as solid as natural, or scanty in quantity.

Hemorrhage from the bowels did not occur in a single case.¹

APPETITE AND THIRST.

Typhoid and Typhus Fevers.—Loss of appetite was one of the earliest symptoms in both diseases, and continued till their termination. There was more or less thirst in every case of the two affections, but my notes do not enable me to state the relative quantities of fluids drank by the two groups of patients, though the point is one of interest, with reference especially to the large quantity of urine passed in many cases of typhus fever, compared with the amount of the same excretion in typhoid fever, even though deduction be made for the loss of fluid by purging in the latter.

THE PULSE.

Typhoid Fever.—The frequency of the pulse varied very greatly in different cases during the same period of the disease. During the first week it ranged from 110 to 132; during the second, from 80 to 128; during the third from 60 to 160; and during the fourth from 96 to too rapid to count.

Its frequency varied much from day to day in the same patient. To show these variations, I have arranged in the following table the number of its beats per minute on particular days in four cases; these variations in its frequency were, so far as could be ascertained, independent of increase or diminution in the severity of local complications: —

Day of Disease.	Beats of Pulse.						
13th	120	18th	76	5th	132	16th	108
14th	100	19th	96	7th	110	17th	108
15th	120	20th	78	8th	120	18th	96
16th	100	23rd	96	9th	102	21st	96
18th	110	26th	108	10th	120	23rd	100
20th	96	27th	96			25th	100
22nd	120	28th	108			28th	90

In a man, who came under observation on the 15th day of the disease, and whose pulse was at that time 120, by the 20th day it had fallen to 96, and by the 21st day to 60; it then gradually rose again

¹ My friend, Dr Parkes, is at present engaged in a chemical analysis of the stools in typhoid and typhus fevers, and his results will appear in a future Number of this Journal.

² For the particulars of these, as well as other cases of the diseases, I may refer to a series of papers now publishing in the *Medical Times*.

till it reached 120 by the 30th day ; the fall in the pulse was in this case accompanied by profound coma, which disappeared as the pulse rose again.

The pulse in one case, which was first seen on the 11th day, and proved fatal on the 25th from hemorrhage from the bowels, gradually rose from 80 to 96, and never exceeded the latter number in the frequency of its beats. The skin in this case was cool, and the mind unaffected, throughout the disease.

The pulse of one patient admitted delirious on the 5th day, and who continued so till his death on the 17th day, varied from 102 to too rapid to count.

In another case—that of a female, who, on the day of her admission (the 12th day of the disease), was violently delirious, and the following day deeply somnolent—the pulse, while she was delirious, was 120 ; the first day of somnolence, 120 ; the second, 144, gradually rose to 160 ; and was too rapid to count on the day of her death, although the somnolence still continued profound, and was uninterrupted by delirium.

The pulse was never hard or bounding ; it was occasionally full and soft, but usually small and weak.

It was irregular in two of twenty-one cases. In one of the two, which proved fatal on the 12th day of the disease, the pulse was on the 5th day very weak but regular ; on the 9th and 10th days it was 130, very weak and irregular in frequency and force ; on the 11th day it was too rapid to count. After death, in addition to the intestinal ulceration common to all these cases, there was found a form of grey hepatization of the lung. The substance of the right ventricle of the heart was flabby—of the left, firm and healthy.

In another case the pulse on the 16th day of the disease was 130, small, weak, and rather irregular ; on the 17th it was 160, and markedly irregular ; and on the following day it was too rapid to count. The whole heart, eleven hours after death, was flabby and soft.

Typhus Fever.—In two patients, who were seen respectively on the 6th and 7th day of the disease, the pulse was 80 and 96 in the minute ; in the former it rose on the following day to 120. During the second week it ranged, with the exceptions about to be described, from 100 to 150 ; and, with those exceptions, in one case only was it as low as 100, and that was seen on the 8th day of the disease—its usual range was from 108 to 120.

Omitting for the present six cases, in which the pulse was at some period of the disease very irregular in force and frequency, and even sometimes intermitting, the cases that recovered so far as the fever was concerned, and those cases that were only seen once, there remain twenty-four cases of which I have notes of the pulse, taken on separate days, the number of days varying from two to nine. In seventeen of these cases it either kept up at the rate it was beating when first observed, or rose till the patient's death. In three of the seven cases which deviated from this rule there was a

slight effusion of blood into the cavity of the arachnoid, coincident with a fall in the pulse of six, of eight, and of forty beats in the minute.¹

In two there was an unusual amount of congestion of the meninges and substance of the brain, with an effusion of serosity on the convex surfaces of the brain; and in one of these two the fornix was distinctly softened. In the sixth case the pulse, when the patient was first seen, was 90; during the night he had an attack of convulsions, and on the next morning it had risen to 96; but on the following day it had again fallen to 90: so that it is probable that the rise in the pulse on the second day was owing to the effect of the muscular exertion during the convulsions not having passed off at the time I saw him. The seventh—the only real exception to the rule—was an old woman seventy years of age, seen for the first time on the 6th day of the disease, when her pulse was 80; on the following (the 7th) day it was 120; and on the 8th—*i. e.*, during the last twenty-four hours of life—it fell to 110.

The pulse in six cases was irregular, or irregular and intermitting, when the first notes of its state were taken. In two of these cases it was respectively 80 and 90, and very irregular; in both cases it rose the following day about 20 beats, finally attained a rate of 140 to 160; and became from the time of its sudden rise regular in force and frequency. In another case it was, when the patient was first seen, 100—irregular and intermitting; on the next day it rose to 120, and was then regular, and free from intermissions. In a fourth case, admitted on the 8th day, the pulse rose during the four following days from 96 to 108, and continued regular in force and frequency; on the 13th day it rose to 120, and became irregular; it was intermitting on the 15th day; and the patient died on the 17th day of the disease. In the remaining two cases the irregularity of the pulse was uninfluenced by the rise or fall in the rapidity of the heart's beats; one of the two had hypertrophy and dilatation of the heart, with some amount of aortic and mitral valvular disease; the heart of the other was loaded with fat, though in general appearance healthy. Of the three cases in which the rise in the pulse was accompanied by a change from irregular to regular, the hearts of two were perfectly healthy; that of the third was somewhat hypertrophied, and in it the mitral valve was very slightly diseased; the heart of the patient whose pulse became irregular as it rose in frequency was by some accident not examined.

Of the patients who were convalescent before the disease began which caused their death, the pulse in one was 120 on the 8th day, and fell by the 14th to 76; in another it was 120 on the 10th day, and

¹ In two of the cases in which the pulse continued to rise till the patient's death, there was meningeal apoplexy; in one of the two it is probable that the effusion of blood took place some days before death, in the other after the last note of her pulse was taken.

by the 14th it had fallen to 84; while in a third, a very mild case, it reached its maximum, 96, on the ninth day, and by the 12th day was only 84.

From the earliest period of the disease that any of the forty-three patients came under my observation, the pulse was decidedly soft, gradually became weak, then very weak, and in many cases during the last few days of life imperceptible. Generally small, it was occasionally full, but still retained its extreme softness.

COUGH AND PHYSICAL CHEST SIGNS.¹

Typhoid Fever.—Twelve of the twenty-three patients whose cases I am analyzing had cough. Sonorous rale was heard more or less extensively in the chests of eleven of the twelve; in the majority, mixed with a little mucous ronchus, two expectorated a little colourless mucus. These rales were present when ten of the eleven were first examined on the 5th, 7th, 13th, 13th, 14th, 14th, 14th, 14th, 16th, and 28th day. In one case there was no sonorous rale till the 12th day, the patient being first seen on the 6th day.

Typhus Fever.—Twenty-one of the forty-three patients labouring under typhus fever had cough, generally slight in amount, and accompanied by little expectoration. Sonorous rale was present in seven of these cases; three had mucous rale more or less abundant, without sonorous; and in nine there was during life some want of resonance of the most depending part of the chest, *i.e.*, the portion corresponding to the most depending portion of the lung, the patient being in the recumbent position, and on his back; this region does not, it will be observed, include the extreme base, the root or apex of the inferior lobe; the respiratory murmur at the same point was feeble and coarse, seemed muffled or veiled, and was accompanied with either a few mucous clicks or sub-mucous rale. After death these physical signs were found to be accompanied by an intensely congested condition of the corresponding pulmonary tissue, occasionally passing into absolute consolidation. Doubtless the same physical signs were present in many other cases, but from the state of the patients very many were unable to be raised in bed sufficiently for the posterior parts of their chest to be examined.

SLOUGHING.

Typhoid Fever.—Sloughs formed over the sacrum in two cases; in one toward the termination of the second, and in the other at the end of the fourth week. In a third case, the left lower extremity as

¹ I have, of course, omitted the physical signs of pneumonia, pleurisy, &c., as the different proportion in which they occurred in the two diseases we are considering will be demonstrated by the lesions found after death. I need scarcely remind the reader that I am here speaking only of cases that proved fatal, and were examined after death.

high as the knee, sloughed. That it was not owing to pressure, was proved by the discoloration first showing itself on the dorsum of the foot, and on the anterior as soon as on the posterior part of the ankle. The diseoloration eommeneed on the 24th day of the disease.

Typhus Fever.—An oval portion sloughed out of the cornea of both eyes in one patient, and of one eye in another; in the latter ease there had been opacity of the cornea for some years before the patient's admission into the hospital.

In one ease, on the 11th day, the dorsum and ankle of either foot assumed a purplish hue, and appeared mottled, exactly resembling the corresponding part in the case of typhoid fever, in which the lower extremities eventually sloughed; this patient died the day after the diseoloration showed itself.

In three cases sloughs formed over the lower part of the back, in one of these a seeond slough formed on the shoulder, and in another on the oeciput, shoulder, malleoli, trochanters, condyles of the femur, angles of ribs, and in fact in the progress of the ease, on every part exposed to the slightest pressure. The sloughs in these eases began to form on from the 13th to the 16th day of the disease.

ERYSIPelas.

Typhoid Fever.—Erysipelas oeeurred in seven of the twenty-three eases. In four of the seven it was very trifling in amount and extent, in none spreading beyond the upper lip and nose. In a fifth case it was by no means severe, and was limited to one side of the head. In these five eases it eommeneed respectively from the 12th to the 34th day of the disease. In two others it made its appearance after the fifth week, dating from the outset of the fever. In these two eases it affected both the head and face, and caused the death of the patients.

Typhus.—In two eases only was erysipelas a complication. In both it was very severe, and confined to the head and face; in one of the two it commeneed on the 18th day of the disease; in the other at an uncertain date, but certainly near the termination of the fever.

Of the nine eases of erysipelas above referred to, seven were females.

THE PATHOLOGICAL LESIONS AND CADAVERIC CHANGES NOTED ON EXAMINATION AFTER DEATH OF THE BODIES OF THE SIXTY-SIX PATIENTS WHOSE SYMPTOMS HAVE BEEN ANALYSED.

My object being to analyse the eases of typhoid and typhus fevers with reference to each other, *i.e.*, for the special purpose of comparison, and not with the intention of determining the symptoms and appearanees found after death from the two diseases, I have thought it useless to include in this analysis the deviations from normal struc-

ture noted in the cases of typhoid fever which proved fatal after the thirty-fifth day, and in those of typhus fever which proved fatal after the twenty-ninth day, except so far as relates to traces of ulceration of the intestinal mucous membrane, and of the larynx, pharynx, oesophagus, and stomach, and the remains of blood in the cavity of the arachnoid. The same purpose has rendered unnecessary, that which would be very necessary if my object had been to determine the symptoms and the lesions of the two affections positively, and not comparatively, —viz., a third set of fatal cases, taken indiscriminately, of other acute diseases. Though I may occasionally be tempted to trace the relations between the symptoms and appearances discovered after death, it would extend my paper far beyond the limits assigned to it, if I should do so in many instances. No such attempt is necessary for my special purpose, *i. e.*, the proof of the non-identity of the two fevers.

CADAVERIC RIGIDITY.

Typhoid Fever.—Sixteen bodies of the twenty-three patients who died of typhoid fever, were examined with reference to the presence and amount of cadaveric rigidity. The condition of seven of the sixteen was noted within twenty-four hours, six between twenty-four and thirty-six, one forty-two and a-half, one fifty, and one fifty-eight, hours after death.

In one of the sixteen, examined twenty-two and a-half hours after death, there was no rigor-mortis, and in another, examined thirty hours after the fatal termination, it was moderately well marked only; in all of the remaining fourteen it was well marked at the times, respectively, at which they were examined.

Typhus Fever.—The bodies of thirty-four of the forty-three patients were examined with reference to this point; fourteen of them within twenty-four hours after death. In six of these fourteen the cadaveric rigidity was well marked throughout the body; in five it had in a great measure disappeared from the upper extremities; in one from the lower; in one it had entirely disappeared from the whole body; and in one it was little marked. In thirteen cases the body was examined between twenty-four and thirty-six hours after death. In one of these thirteen only was the rigor-mortis well marked in the upper and lower extremities; in four it had disappeared from the upper limbs; in three it was moderate in the legs and arms; and in five it was but little marked in either of the extremities. Of seven other bodies examined, with respect to the point we are considering, more than thirty-six hours after death, it was well marked in one forty-eight hours after death; it was moderately well marked in another forty-two hours, and had disappeared from a third forty-two hours, and nearly so from a fourth forty hours, after death;—while it was present in the lower extremities, examined in the remaining three of the seven, respectively, thirty-eight, forty-five, and fifty-two hours after the termination of life.

Thus, cadaveric rigidity was well marked in all the extremities of six of the seven bodies of the patients who died from typhoid fever and were examined during the first twenty-four hours after death with reference to the point in question ; while it was well marked in all the limbs in six only out of fourteen dead from typhus fever examined during the same period ; or if we take the whole of the cases, it was more or less absent in two of the sixteen bodies of the patients who died of typhoid fever, *i.e.*, one eighth of them, or in the proportion of 12·5 per cent. ; while it had more or less disappeared, during the same period, from twenty-six of the thirty-four cases of typhus fever, *i.e.*, from more than three-fourths of them, or in the proportion of 79·4 per cent. I was not aware of this remarkable difference having existed, till I made this analysis, or many points of interest connected with it might have been made out, but then I have the satisfaction of knowing, that if I have ascertained less on the point than I might have otherwise done, that in what I observed I could have been biassed by no pre-conceived opinion on the subject. Anxious to ascertain the real cause of the difference, I have examined the two groups, *i.e.*, those of typhoid and typhus fever, with reference to the state of the weather at the time the subjects lay in the dead house, the age and previous state of health of the patients, the local complications, and the duration of the disease in the separate cases included under each group. The result of my investigations on these points is, that none of these circumstances was the cause of the difference observed in the duration of the cadaveric rigidity, so that it could only have been due to some peculiar state of the system, induced by the disease itself. The only one of the fifteen cases of typhoid fever in which there was no cadaveric rigidity, was that in which the coma and prostration preceding death for some days, was the most extreme.

As the subjects were removed from the shell to the dead-house table by the arms and legs, it is evident that force was applied to the knees in such a mode as to prevent their flexure, while it was applied to the arms so as to make them bend, and this probably was the cause of the cadaveric rigidity being less marked in the latter than in the former limbs in so many cases, but then the same mode of removing the body from the shell was used in the cases of typhus and typhoid fevers, and therefore, if the cadaveric rigidity had not disappeared spontaneously from the upper extremities in the former, it was overcome with a much less amount of force than in the latter.

SPOTS.

Typhoid Fever.—In one case only was there a trace after death of any spot marked during life. It was a very faintly marked, brownish point, and would undoubtedly have escaped notice if the rose-spot which caused it had not, during life, been encircled with an ink mark. It could by no possibility have been confounded with the

spots about to be described under the head of typhus fever. It was limited to the surface, and, on section, was seen not to extend into the cutis.

Typhus Fever.—On the surface of the trunk and extremities, small spots of a purple colour were detected in twenty-seven cases; in eleven of the forty-three cases of typhus fever I am analysing, the spots had disappeared before death; no note was made of their presence or absence in the remaining five cases.

The spots noted during life as becoming paler on pressure, were after death of a faint brownish purple hue. Those marked as unaffected by pressure during life retained generally the appearance they presented before death, and in some instances the ink-marks made during life indicating that a particular spot had passed through all the three stages described in a former part of this paper, under the head mulberry rash, were still visible, the spot after death presenting the character of the third stage, *i.e.*, a non-elevated purple spot, with well defined border, unaffected by pressure.

As during life, so after death, the spots situated on the most depending parts of the body, the subject being on its back, were the darkest in hue, and were often well marked when those on the anterior surface were scarcely visible. That this difference in hue was dependent on position, was in some measure proved by the fact, that the intensity of the hue gradually increased down the sides of the trunk, *i.e.*, passing from before backwards.

A piece of skin being removed from the subject, the following appearances were observed with the aid of a lens,—a faint brownish red or purple hue of the spots marked, as only fading on pressure during life, limited to the surface of the cutis. The purple colour of the well defined spots, unchanged by pressure during life, affected the whole thickness of the cutis, and even extended into the subcutaneous tissue; a few minute vessels, still loaded with blood, converged towards the discoloured spot, but none were discernible in the spots themselves; their colour appeared to be due to infiltration of the tissue by a solution of hematin. The hue of these spots was even darker below the epidermis than on the surface.

That the spots observed during life were the same as those noted to be present after death, was proved by the ink-marks remaining which had, before death, been placed around several of them for the purpose of securing attention to the same spots throughout their varying changes. The absolute identity of the spots was thus demonstrated.

As no spot was to be seen, with the one exception previously referred to, within the circle made during life around the rose-spots of typhoid fever, it was indisputably proved that those spots were not permanent. As no patient affected with typhus fever died while the mulberry rash was in its first stage, I am unable to say whether, in that stage, *i.e.*, while the spots constituting it disappeared on pressure, they would have been visible after death. I should suppose not, *a priori*.

Miliary Vesicles.—As I stated while analysing the symptoms, miliary vesicles were detected in four of the cases of typhoid fever after death, and in three of the cases of typhus. The difference in the proportion being, as I then pointed out, due to the *age* of the patients rather than to the *disease*.

VERGETURE OR DISCOLORATION OF THE POSTERIOR SURFACE OF THE TRUNK AND EXTREMITIES.

Of the difference on this point my notes enable me to say nothing positive, because I failed to record its varying intensity. To a greater or less extent it was present in all the cases of both groups of which notes on the point were made. My impression—but how fallacious impressions are, none can be more deeply sensible than myself—is that it was much deeper in hue, and extended far higher up the sides of the trunk, the subject being on its back, in those dead from typhus than in those dead from typhoid fever.

GREEN OR PURPLE DISCOLORATION OF THE CUTIS INDICATING THE COURSE OF THE LARGER VEINS.

Typhoid Fever.—This cadaveric change was not present in a single instance.

Typhus Fever.—Excluding five cases that survived more than twenty-nine days, discolouration in the course of the veins was observed in six, or in nearly one-sixth of the remaining thirty-eight cases.

GREEN DISCOLORATION OF THE WALLS OF THE ABDOMEN AND THORAX.

Typhoid Fever.—Omitting four cases that survived beyond the thirty-fifth day of the disease, two cases of which no notes on the point were made, there remain eighteen of the twenty-three cases of typhoid fever.—In three or one-sixth of the eighteen cases the abdominal walls were more or less discoloured, the subjects being examined, respectively, twenty-four, twenty-six, and thirty-six hours after death.

Typhus Fever.—Of the thirty-eight of the forty-three cases available for analysis, with reference to this point, the abdominal parietes were discoloured in ten, or more than a fourth. The patients being examined respectively, thirty-eight, twenty-five and a-half, forty-two, twenty-six, fifty-two, twenty-four, twenty-seven and a quarter, forty, twenty-seven, thirty-five and a-half, hours after death.

That the discolouration was due to some cause acting from within, was proved by those parts which were protected from the action of—say a gas generated within—retaining their natural hue; when the liver projected below the ribs, that portion of the abdominal wall with which it lay in contact, preserved its natural colour, and in one instance, when the bladder was distended, its position was clearly

marked out by the green hue of the abdominal parietes around. The intercostal spaces were always affected before the skin covering the ribs, and the cutis over the larynx before the sides of the neck; the skin around the mouth before the other parts of the face. In one case in which there was gangrene of the lung, the subject, æt. twelve, being examined twenty-six hours after death, green discolouration of the intercostal spaces was well marked, while the skin over the ribs retained its normal appearance.

EMACIATION.

Typhoid Fever.—In eight, or nearly one-half of the eighteen cases, there was marked emaciation; in five of the eight, extreme emaciation; in five, no emaciation; of five cases no note was made.

Typhus Fever.—In seven, or less than one-fifth of the thirty-eight cases, there was more or less emaciation; in three of the eight only was it extreme; in seventeen cases there was no emaciation; of thirteen cases no note on this point was made.

MUSCLES.

Typhoid Fever.—In one case only were the muscles noted to be particularly dark in hue.

Typhus.—In six, or about one-sixth of the thirty-eight cases, the muscles were noted to be of an unusually dark colour. In two cases there was a considerable quantity of dark loosely coagulated blood in the substance, and anterior and posterior to, but within, the sheath of the rectus abdominis; in both instances it was situated between the umbilicus and pubis, in one of the two in both recti, in one in the left rectus only; the clot in the former case extended for about six inches in length, in the latter two only. The muscular substance in both was softened at the part.

HEAD.

Typhoid Fever.—Fifteen only of the twenty-three cases of typhoid fever are available for analysis, the remaining eight either lived more than thirty-five days, or I was unable to examine the head.

The consistence of the brain generally, in the fifteen cases, was normal; there was no trace of softening or abnormal induration in any portion of the cerebral substance. Seven of these fifteen brains were examined more than twenty-four hours, one forty-four and a-half hours, and one as late as fifty-eight hours, after death. The two latter, however, were examined in the month of January, the thermometer, during the time the latter case lay in the dead-house, standing below 32°.

In one case there was no trace of the commissura mollis: the subject was a man thirty years of age—was examined thirty hours after death, in the month of October, the weather at the time being wet

and cold. In five of the fifteen the supra cortical layer of white matter was more or less marked.¹

Congestion of the cerebral substance.—Fifteen of the twenty-three cases of typhoid fever were examined with reference to this condition of the brain, and in two of the fifteen—*i. e.*, less than one-seventh, or in the proportion of 13·4 per cent., the red points were more numerous than natural.

Membranes.—The dura mater retained its normal appearance in every one of the fifteen cases. In one case only was there marked congestion of the pia mater, and in only four others slight increased congestion of the larger vessels of the pia mater. While in the remaining ten cases they were normal, or paler than natural, so that the non-congested were to the congested in the proportion of two to one, and to the intensely congested, fourteen to one. In nine only of the fifteen cases was any note made of the facility with which the membranes were able to be stripped from the convolutions of the brain, and in one case only were those noted able to be removed with abnormal facility, and in larger portions than natural.

Fluid contained within the Cranial Cavity.—The quantity of fluid found after death within the cavity of the arachnoid on the lower surface, and at the base of the brain, was noted in seven of the fifteen cases available for analysis; in eight cases no note was made on this point. The amount varied from half a drachm to an ounce, the average quantity being about half an ounce. *In all the cases it was colourless and transparent.*

Fluid of a similar character was noted to be present in the lateral ventricles in thirteen cases; the quantity varied from half a drachm to an ounce, the average quantity being about two or three drachms. Immediately beneath the arachnoid, or infiltrating the meshes of the pia mater, there was some effusion of colourless serosity in nine cases; in six others no note on the point was made, probably from there having been in these cases no deviation from health. In one case only was it noted to be considerable; in the other eight it was described as “a little,” “very little,” “very trifling.”

Choroid Plexus.—There was no congestion of the vessels of the choroid plexus in any of the cases examined with reference to the fact.

Typhus Fever.—Omitting the cases in which no examination of the head was made after death, and those which survived beyond the twenty-ninth day of the disease, there remain thirty-six of the forty-three cases for analysis. In four of these thirty-six the consistence of the brain was slightly diminished; in one of the four the softening had, in the septum lucidum and fornix, attained a considerable degree; in a fifth case there was slight softening of the fornix, the remainder of the brain having a normal consistence; while in a sixth case there was softening of the

¹ See Baillarger—*Seances de l'Academie de Medecine*, June 21, 1840.

septum lucidum only. The first four subjects were examined respectively thirty-six, forty-eight, forty, and twenty hours after death, the last being the case in which there was considerable softening of the fornix and septum lucidum; the examination of the head in the fifth case was made fourteen, and in the sixth twenty-two and a-half hours after the death of the patients. In a seventh case, examined thirty-eight hours after the fatal termination, there was decided softening of the left half of the cerebellum. With these seven exceptions, the brain retained its normal consistence. In two cases, although carefully sought for, there was no trace of the commissurae mollis; had this absence been only apparent—*i. e.*, due to softening—the true nature of the case would have been manifested by an examination of the ventricular surface of the thalami optici; the serous membrane covering which would in such case have been wanting at the point where the cord of nervous matter emerges from the thalami. In one case there was an aperture in the septum lucidum, not formed by softening or handling; the edges of the perforation were firm and smooth, the serous membrane lining the two lateral ventricles being apparently continuous over its edges. The supracortical layer—*i. e.*, a film of white matter spread over the outer surface of the grey matter—was well marked in twelve cases, in two others imperfectly; no note with reference to the point was made in the remainder. For reasons into which I cannot at present enter, I believe this layer of white matter not to have been due to decolorisation of a portion of the grey by maceration.¹

Congestion of the Cerebral Substance.—In fifteen of the thirty-six cases—*i. e.*, rather less than one-half, or in the proportion of 41·8 per cent.—the red points scattered over the cut surface of the brain were more numerous than natural.

Membranes.—In ten cases there was marked congestion of the dura mater; in five it was thickened and opaque—three of the five were more than fifty years of age.

In twenty-one of the thirty-six cases the larger vessels of the pia matter were more or less distended with blood. In eight of these twenty-one cases the smaller vessels were also congested; and in one case, in which the larger vessels were not abnormally congested, the smaller were minutely injected. In seven of the twenty-one cases, the congestion was trifling in amount. In nine cases the vessels of the pia matter appeared to be in a normal condition—at any rate there was in these nine no abnormal congestion. In four other cases there could have been no great deviation from a healthy state, as no note of their condition was made, although other points respecting the condition of the brain and its membranes were recorded. So that, if we consider the vessels of the pia matter to be normally injected in these four cases, the congested still bear to the non-congested the proportion of 160 to 100.

¹ See Baillarger, op. cit.

In seven of the thirty-six, or in one-fifth of the cases examined, there was intense congestion of the pia matter, while, as was before shown in the cases of typhoid fever, the moderately-congested bore to the non-congested the proportion of 1 to 2, and there was only one case in which the pia matter was intensely congested of the fifteen examined.

In eleven cases only was the facility with which the membranes separated from the surface of the convolutions noted, and in nine of the eleven they did so with abnormal facility, and in such large portions that my notes state that the membranes peeled off *en masse*. No portion of the cerebral substance was in any case removed with the membranes; the facility, therefore, with which they separated from the cortical substance was not owing to softening of the grey matter.

I deeply regret that this particular was not more frequently noted, as, when well marked, it is one of the most characteristic appearances found after death from typhus fever, but by no means the anatomical character, as in one of these eleven they were removed with difficulty, and in another case with only slightly increased facility. The quantity of fluid found after death on the convex surface, and at the base of the brain within the cavity of the arachnoid, was noted in twenty-five cases. In ten others, probably for the reason before assigned, no note was made. The quantity of fluid varied from about two drachms to two ounces; the average quantity being one ounce. In three cases it was slightly yellowish; in the others (excepting the cases of hemorrhage into the cavity of the arachnoid) it was transparent and colourless.

The lateral ventricles contained from a few drops to one ounce of transparent colourless fluid; the average quantity was from about two to three draehms.¹

More or less serosity was infiltrated into the meshes of the pia matter, or effused beneath the arachnoid, in twenty-three cases. No note was made on the point in the remaining cases, probably for the reason before assigned—*i. e.*, that in these there was little or no deviation from health.

The quantity of serosity was decidedly greater in a large majority of the cases of typhus fever than in the cases of typhoid fever. The amount of the fluid having been in the former described by the terms “much,” “considerable,” and in two only of the twenty-three by the expression “very little.”

¹ I think it right to state, that the amount of fluid was not measured in these cases; but as the quantities were estimated at the time the examination of the head was made by the same observer, it is probable that the comparative amounts are correct, although the absolute quantities are not available for accurate calculation. The fluid ought to have been removed by a pipette and measured, as it was by Dr John Reid, in his admirable researches into the pathological appearance found after death in fever. But as my guessed quantities differ but little from those obtained by accurate measurement by that philosophic observer and reasoner, I trust they are not far from the truth.

Choroid Plexus.—In four cases the vessels of the choroid plexus were noted to be abnormally distended with blood.

HEMORRHAGE INTO THE CAVITY OF THE ARACHNOID.

Typhoid Fever.—In nineteen of the twenty-three cases the head was examined after death; and in none of these was there the slightest trace of blood in the cavity of the arachnoid.

Typhus Fever.—In thirty-nine cases the head was opened, and in five of them coagula of various sizes were found within the cavity of the arachnoid. In every case the coagulum was in the form of a delicate red film, varying in thickness, and consequently in hue, in different cases and in different parts of the same clot. It was almost colourless where thinnest, bright red where a little thicker, and deep purple at the thickest parts. It was in every case situated on the convex surface of the brain, and in one stretched from the anterior lobe to the tentorium, and from the median fissure to a point corresponding to a line drawn transversely, just above the external auditory foramen. In one case it consisted of two or three delicate fibrinous films only. When the dura matter was reflected, part of the clot adhered to the layer of arachnoid lining that membrane, and part to the layer of arachnoid covering the pia matter. In three of the five cases the clot was double—*i. e.*, existed on both hemispheres of the brain. In two cases it was confined to the right side.

In one of the five it was accompanied by effusion of blood into the substance of the rectus abdominis. The substance of the brain was firm in four of the five, and apparently healthy in all. The vessels of the cerebral substance and its meninges were not particularly congested; the blood in the vessels of the pia matter fluid, but unable to be pressed out of them into the cavity of the arachnoid. No aperture could be found from which the blood had escaped—the sinuses were perfectly healthy: the source of the hemorrhage could not, consequently, be discovered.

PHARYNX AND LARYNX.

I have conjoined the appearances found after death in these two organs, because both were in numerous instances diseased in the same subject; and because the relation which the pharyngeal bears to the laryngeal affection is important in a practical as well as in a theoretically pathological view.

The term inflammation has been used, because the appearances found after death, and the signs and symptoms observed during life, so closely resemble, if they are not identical with those described by that term, that I cannot follow Rokitanski, and call these phenomena "diffused congestive typhous processes," especially as that author offers no proof that these local changes are peculiar to typhoid fever.

Typhoid Fever.—The larynx and pharynx were examined in fifteen of the twenty-three cases—they were both healthy in six, *i. e.*, more than one-third, or exactly in the proportion of 40 per cent.

Ulceration of the pharynx was found in four cases ; in one of the four there was an ulcer seated on the posterior aspect of the velum pendulum palati and uvula, by which the mucous membrane covering the latter and a small part of the former was completely destroyed ; the breadth of this ulcer was four lines ; its edges were bright red, and not elevated ; its floor, formed of submucous cellular tissue, was dusky red ; the ulceration was quite superficial. In the same case there was a similar but smaller ulcer on the hard palate, and the arytaeno-epiglottidean folds were considerably thickened, the chordæ vocales swollen, the mucous membrane of the larynx generally congested, and covered with muco-purulent fluid. Erysipelas, trifling in extent, had affected this patient a few days before death. In another of the four cases there were two or three small ulcers on the posterior wall of the pharynx. In the third an oval ulcer, half an inch in width, partially divided into two by a strip of apparently healthy mucous membrane, was found in the pharynx, just at its junction with the œsophagus ; the floor of this ulcer was formed by the submucous cellular tissues of a yellowish colour, its edges, like the mucous membrane of the pharynx generally, were very pale ; and there was in the same subject a second small superficial ulcer, seated a little below the one just described. In the fourth case four ulcers were seated on the posterior wall of the pharynx ; one of the four ulcers was three quarters of an inch in width, irregular in shape, its edges slightly elevated, sharp, and of a dark purple colour, its floor formed of the congested naked fibres of the middle constrictor of the pharynx ; two or three similar, but much smaller ulcers, were seated around the larger one ; the whole mucous membrane of the pharynx was dusky red. In the three latter cases, the mucous membrane of the larynx was pale, and healthy in aspect ; in three of the four cases, therefore, the larynx was healthy. In a fifth case there was ulceration and enlargement of both tonsils—increased vascularity of the pharynx, and redness of the upper and under surface of the epiglottis. In two cases there was distinct thickening (from submucous effusion of serosity) of the arytaeno-epiglottidean folds and epiglottis ; in one of the two there was also effusion of serosity beneath the whole mucous membrane of the pharynx and larynx—in both the serosity was colourless and transparent, and the mucous membrane itself of the larynx and pharynx pale. Both patients were suffering from erysipelas of the head and face at the time of their death.

In one case the pharynx was dusky violet, the upper and under surface of the epiglottis of a bright scarlet colour from minute injection ; and there was a small ulcer on the corresponding parts of either chorda vocalis. The larynx appeared healthy in another case, in which there were numerous collections of a purulent-looking fluid, varying in size from a pin-head to a small sweet pea beneath, and elevating the mucous membrane of the pharynx, that membrane itself being pale. This patient suffered from erysipelas a few days before his death.

The conditions of the larynx and pharynx discovered after death in the fifteen cases, may be thus summed up :—

No vestige of old disease in any of the cases.

Both organs healthy in six, or, if the two cases be added in which the disease of the pharynx in the one, and of the larynx in the other, supervened after the termination of the fever, in eight cases, *i.e.*, in the proportion of 53 per cent.

Ulceration of the pharynx in one-third of the cases.

Ulceration of the larynx in one case.

Signs of inflammation of the pharynx in six cases; but in two of these the inflammation set in after the termination of the fever. As two of the cases of ulceration of the pharynx were unattended by any other sign of inflammation of that organ, the pharynx was diseased during the progress of the fever in eight cases.

Signs of inflammation of the larynx in five cases.

Larynx and pharynx diseased in the same subject (excluding one case in which erysipelatous inflammation had set in after the fever had terminated) in three cases, that is, in one-fifth of the cases in which the organ was examined.

Larynx healthy, pharynx diseased, in three cases, or one-fifth of the whole examined.

Larynx diseased, pharynx healthy, in one case; but in this case it was doubtful whether the disease was, during life, confined to the larynx, although no morbid appearance could be discovered in the pharynx after death.

From this analysis, I think it may fairly be concluded, that in these cases the laryngeal was secondary to the pharyngeal affection, and that *in typhoid fever laryngitis independent of pharyngitis is extremely infrequent.*

Typhus Fever.—The larynx and pharynx were both examined after death in twenty-six of the forty-three cases of typhus fever I am here analyzing.

Both organs were healthy in sixteen of the twenty-six cases. In one other case they were both healthy, with the exception of a little blood effused beneath the mucous membrane of the pharynx. In the remaining nine of the twenty-six cases, there were unequivocal traces of disease. The larynx and pharynx were deep purple, and covered with slimy mucus in one case. In four there were unequivocal traces of inflammation in both organs; thus, in one of the four the mucous membrane of the pharynx was deep red, of the larynx vivid scarlet, the redness on minute inspection being found to be punctiform; in another of the four the lining membrane of the pharynx was of a dirty yellowish colour, and so soft that it was removeable by the gentlest scraping; the chordæ vocales swollen, the rima glottidis a mere chink, the mucous membrane of the larynx generally vividly injected and covered with muco-purulent fluid, and on the chordæ vocales, and on the mucous membrane lining the larynx above the chords, were numerous shreds of white

opaque lymph-like matter, readily removable. In the third case, the lining membrane of the pharynx was covered with thick mucus, felt rough, apparently from enlargement of its follicles, and was of a dull purple colour ; there was a small ulcer on either chorda vocalis, but no other trace of inflammatory action within the larynx. The pharynx in the fourth case was studded with small yellowish spots, from which, on section of the mucous membrane covering them, a drop of purulent-looking fluid exuded. The lining membrane of the larynx in the same subject was dusky red, the chordæ vocales and arytaenoid-epiglottidean folds distinctly thickened from effusion of serosity into the submucous cellular tissue.

Old disease of the parts was present in two cases, the subjects being aged respectively fifty-six and forty-five ; in one of the two the pharynx was congested ; the mucous membrane of the larynx, covered with dirty, frothy mucus, was opaque and somewhat greenish in hue ; the under surface of the epiglottis was irregularly thickened, so that it presented a mammillated appearance ; just below the left chorda vocalis was a round aperture leading to a small cavity containing some sloughy matter ; the base of the arytaenoid cartilage ossified and necrosed was exposed. The other of the two cases terminated fatally on the 17th day of the disease. No history of the patient prior to admission could be obtained ; after death, there was an old cicatrix on the posterior wall of the pharynx, and a small superficial ulcer on the same part ; the mucous membrane of the pharynx and upper surface of the epiglottis was of a deep grey colour. Taking into account the cicatrix, the colour of the mucous membrane, and the duration of the fever, we cannot but conclude that the superficial ulcer was the consequence of chronic inflammation of the pharynx, which had existed prior to the attack of typhus. In one case in which the mucous membranes of the larynx and pharynx were pale and otherwise healthy, there was spread over the former some purulent fluid.

In one case only was there an ulcer in the pharynx, the result of recently established diseased action. It was small and superficial, and seated at the base of the left anterior pillar of the fauces. The mucous membrane of the pharynx was in this case of a deep red colour, and covered with finely granular, yellowish lymph. Similar granules of lymph covered both surfaces of the epiglottis. When the lymph was removed from the latter, the mucous membrane covering it was seen to be vivid scarlet ; the lining membrane of the larynx generally was of a pale rose-red, the chordæ vocales slightly thickened. The subject of these serious lesions was attacked with phlebitis after he had completely recovered from a mild attack of typhus fever, and had even left his bed ; it was during the second attack that hoarseness supervened. There had been no pharyngeal symptoms during the progress of the fever.

To sum up :—Of twenty-six cases in which the larynx and pharynx were examined after death, they were

Both healthy in seventeen cases, *i. e.*, in the proportion of 65·4 per cent.; or if the two cases be added in which the disease was evidently of old standing, and the one in which it supervened after the patient had recovered from the fever, twenty cases, *i. e.*, in the proportion of 77 per cent., passed through the disease without any affection of these organs.

In five cases there were signs of inflammation of both larynx and pharynx, *i. e.*, in about one-fifth of the cases. In one of the five ulceration of the larynx.

Inflammation of the larynx, the pharynx being free from lesion, in one case.

In no instance was the pharynx diseased and the larynx healthy, but in two of the five in which both were inflamed, the lesion of the pharynx was much more profound than that of the larynx.

Ulceration of the pharynx as a consequence of the fever was not detected in a single instance.

Thus it may be stated that if the laryngeal affection in typhus fever be not invariably preceded by pharyngeal disease, it is almost always so. The difference between the two diseases as exhibited by the great tendency to pharyngeal ulceration, in the cases of typhoid fever (ulceration of the pharynx occurred in one third of the cases) and by the total absence of any such lesion in the cases of typhus fever, is remarkably striking.

The relation which existed between the laryngeal and pharyngeal affection and erysipelas was undoubtedly intimate.

ŒSOPHAGUS.

Typhoid Fever.—The œsophagus was examined in seventeen of the twenty-three cases. In sixteen it was healthy.¹ In one it was extensively ulcerated. The ulcerations, several in number, extended five and a-half inches upwards from just above the cardiac orifice of the stomach. The circular muscular fibres of the œsophagus were at places exposed. One of the ulcers was three inches in length, and half an inch in breadth. All were longer than they were broad. The edges of the majority were slightly elevated. The mucous membrane between was here and there finely injected.

Typhus Fever.—The œsophagus was examined in twenty-four of the forty-three cases. It was healthy in all.

Covering the œsophagus is frequently observed a thin layer of opaque white curdy matter. Microscopic examination has demonstrated to me that this layer is composed of epithelium. Whether it

¹ There is in the normal condition of the parts a marked difference in hue between the colour of the mucous membrane of the pharynx and œsophagus. The somewhat purplish colour of the former generally ceases abruptly on a line corresponding to the upper border of the larynx. I mention this because I have occasionally observed this appearance described by those unaccustomed to examine these organs, as a morbid appearance.

separates more readily in the one disease than in the other is worthy of investigation, especially with reference to a condition observed in the kidney tubes. My notes do not enable me to determine the comparative frequency of this probably cadaveric change in the two diseases I am here considering.

STOMACH.

Typhoid Fever.—Excluding the cases in which the stomach was not examined, and those which survived the thirty-fifth day of illness, there remain fifteen cases for analysis with reference to the condition of the stomach generally, and twenty with respect to the presence or absence of ulceration of that organ.

The cases that proved fatal after the 35th day are available so far as concerns ulceration of the organ, because unequivocal traces of that lesion are left in the form of cicatrices for some time after the healing process is completed.

If any appearance of healed ulcers in the stomach had been discovered in the cases that proved fatal after the termination of the fever, then a question might have been raised as to whether the cicatrices had existed prior to the commencement of the fever. But no trace of pre-existing ulceration was detected, therefore these cases may be admitted as unimpeachable evidence.

Colour.—No note of the colour was made in four cases. In these four it must have been healthy, or nearly so. In six cases it was pale. In one there was scattered over the whole mucous membrane some bright red lines and patches. In another there was punctiform redness, and softening of the mucous membrane to the extent of three inches, commencing from the pylorus, and stretching towards the cardiac extremity; it was in the same case mammillated to near the cardiac extremity, *i. e.*, commencing at the pylorus. The mucous membrane retained in this case its normal consistence at the cardiac extremity. There were a few rugæ.

In two cases the mucous membrane was somewhat grey. In one of these cases the posterior portion of the great cul-de-sac was speckled with deep red, the mucous membrane of the cardiac extremity was rather soft, the remainder of the organ normal in consistence and thickness. In the other of these two cases the mucous membrane was rugose and mammillated with the exception of the great cul-de-sac, generally softened, the softening especially affecting the pyloric half. In two other cases there was marked increase in the vascularity of the cardiac extremity of the stomach.

Ulceration.—In one case only was there recent ulceration. In this case the mucous membrane of the stomach was pale and smooth, its consistence and thickness normal. Scattered over the anterior and posterior wall and greater curvature were numerous minute ulcers, varying in size from a pin-point to a line in diameter; their edges and floors were pale; the former rounded, the latter formed of sub-mucous cellular tissue.

In no case was there any trace of old ulceration, or of chronic inflammation¹ of the organ.

Softening.—In ten cases the mucous membrane retained its normal consistence. In two it was slightly softened at the cardiac extremity. In three near the pylorus; in one of these three there were numerous red spots on the posterior wall of the stomach, varying in size from a mere point to a pin-head. The softening in this case was limited to the red spots and their immediate vicinity, and in another of the three cases the softening of the pyloric portion of the stomach was accompanied by punctiform redness.

In no instance was any softening approaching perforation observed. In no instance was the mucous membrane firmer than natural; in no instance softened throughout the organ.

Thickness.—In one case the mucous membrane was noted to be generally somewhat thickened. In six cases it was recorded to be of normal thickness.

Mammillation.—In two cases there was no mammillation; in one nearly the whole membrane was in that state; in two cases it existed from the pylorus to near the cardiac extremity; in three it was limited to the vicinity of the pylorus; while in five of the fifteen cases no note of this particular was made.

Typhus Fever.—Omitting the cases of which no notes were made with respect to the condition of the stomach, and those which survived the 4th week of disease, there remain for analysis generally thirty-seven cases, and with respect to ulceration forty-two.

Colour.—The stomach was noted to be pale or healthy in colour in twenty-three of the thirty-seven cases. Of an uniform dusky grey hue in two cases. There was punctiform redness along the greater curvature, and anterior and posterior surfaces of the mucous membrane adjoining, in one case. Minute hemorrhagic spots in the cardiac extremity in two cases. Some redness of the great cul-de-sac in one case. The mucous membrane in the four last-mentioned cases retained its normal colour in the other parts of the organ.

There were signs of chronic inflammation of the mucous membrane of the stomach in seven cases, *i. e.*, it was grey, speckled with red, thickened, altered in consistence, or covered with tough mucus, and in four of the seven were unequivocal cicatrices.

Ulceration.—In one case the mucous membrane of the whole stomach was remarkably rugose, mammillated from pylorus to cardia, and of a dull roseate hue; in the great cul-de-sac the redness was remarkably vivid, and on minute inspection was found to be punctiform. Three inches from the pylorus, scattered over a space about an inch and half in circumference, and seated on the posterior wall of the stomach, were nine ulcers, varying in size from a pin-point to

¹ I do not include mammillation of the mucous membrane of the stomach under the term of chronic inflammation of that organ. The true significance of this condition of the membrane, it appears to me, has yet to be determined.

No. 4 shot; their edges were well defined and not discoloured; there was no softening of the mucous membrane; on the contrary, it was noted rather tough.

In no other case was there evidence of recent ulceration, for it so happened, as has been before remarked, that the old cicatrices were observed only in those cases which proved fatal during the progress of the fever. The ages respectively of the subjects in which the cicatrices were noted were 33, 40, 42, 56, and 61 years.

Mammillation.—The presence or absence of this condition of the mucous membrane was recorded in fourteen cases only. In one, the case before referred to, it was general. In six, it was limited to the vicinity of the pylorus. In seven cases there was no mammillation.

Consistence.—The mucous membrane was noted to be of normal, or nearly normal, consistence, in twenty-two cases. It was generally rather firmer than natural in four. In one of these four there were recent ulcers; in two others cicatrices of old ulcers; in one case, in which the mucous membrane was of a reddish hue posteriorly, of a darker red anteriorly, and of a vermillion tint along the great curvature, the redness being punctiform and capillary. The consistence, which was generally natural, was, at the reddest parts, slightly increased; the same parts were also thicker than natural. No note was made with respect to the consistence of the mucous membrane in one case. In four, it was generally softer than natural; in one of these four the cardiac extremity was disproportionately soft. In four cases, there was such extreme softening of the great cul-de-sac, that it ruptured in the removal, or in the washing of the organ. The ages of these four subjects were 33, 49, 50, and 50. Two of these cases terminated respectively on the 12th and 16th day of disease; the other two during the course of the fever, but the exact date was never ascertained.¹ In no case was the mucous membrane in the vicinity of the pylorus softer than that covering the cardiac extremity.

Thickness.—In three cases the mucous membrane was noted to be generally increased in thickness. In one case (before referred to) it was partially thickened; in twenty-one cases it was noted to possess its normal thickness.

DUODENUM.

Typhoid Fever.—Excluding eight cases, which either survived the fever, or were not examined with reference to the condition of the duodenum, there remain for analysis fifteen cases. There was no marked deviation of the duodenum from health, in ten of the fifteen. In one, its mucous membrane was finely injected, and in another it

¹ I shall reserve, till another opportunity, the minute analysis of these cases of perforation; their number is too few to lead to any satisfactory conclusion; and I have accounts of others, which may be added to these, though not admissible in this place, because they do not come within the limits I have laid down for the cases here analysed.

was reddish-grey; in both of these cases there was redness and softening of the pyloric portion of the stomach. In one case there was vivid redness of the upper part of the duodenum, the stomach being perfectly healthy in appearance. In two cases the mucous membrane of the duodenum was pale grey; in one of the two the stomach was greyish, and in the other there was considerable redness, in patches and lines, of the latter organ. In no case was there any trace of ulceration.

Typhus Fever.—Six cases being omitted as not available for analysis, except in so far as traces of ulceration of the organ are concerned, there remain for examination thirty-seven of the forty-three cases here considered.

In twenty-eight the mucous membrane appeared perfectly healthy. In two it was stained yellow, and slightly softened; in one of these two the mucous membrane of the stomach was in the same state. In one case, the mucous membrane of the duodenum was vividly injected; in five others it was of a grey colour. In one of these five Brunner's glands were remarkably prominent. Signs of chronic inflammation of the mucous membrane of the stomach existed in four of the six cases last referred to, old cicatrices having been noted in that organ in four of them; and in the other two of the six the mucous membrane of the stomach was pale grey, though otherwise healthy in appearance.¹

In one case there were some hemorrhagic spots beneath the mucous membrane, on the edges of the valvulae conniventes, the intervening membrane being pale and healthy.

In no case was there recent ulceration, and in no case traces, in the form of cicatrices, of healed ulcers.

From this analysis, I think the conclusions may legitimately be deduced, that the duodenum is rarely affected in fever, and that it is not common for it to be the seat of chronic inflammation, unless in conjunction, and probably secondarily to the same affection of the mucous membrane of the stomach.

JEJUNUM AND ILEUM.

Typhoid Fever.—Seventeen cases proved fatal before the thirty-fifth day of the disease; only these seventeen, therefore, can be examined with reference to the colour and consistence of the mucous membrane; but all the twenty-three are evidence with respect to the presence or absence of ulceration.

Colour.—The mucous membrane generally was pale or healthy in

¹ As some persons have spoken of the solitary glands at the lower part of the ileum as Brunner's glands, I think it well to state, that I intend, here and elsewhere, to limit the term to those glands described by Brunner as existing in the duodenum. They are well known to be very different in structure and situation from the solitary and agminated glands found in the ileum.

eleven of the seventeen cases. The whole membrane was finely injected in one case; in another there was ramiform injection in patches; in two others the lower part of the ileum, in one two feet, in the other five inches, upward from the ileo-cœcal valve, was finely injected; in this latter case the jejunum was, like the duodenum, greyish, while the upper part of the ileum was pale. In another case the jejunum and upper part of the ileum was ash grey, the lower part of the ileum pale. In one case two feet of the ileum were of a grey colour; this case proved fatal on the 25th day of the disease.

Consistence.—Notes on this point were made in fourteen cases only; in eleven of the fourteen it was natural, in three softer than normal. In one of the three cases the softening was confined to the lower two feet of the ileum; in the other it was general, but slight in amount; in all three the mucous membrane was pale, and of normal thickness.

Agminated Glands or Peyer's Patches.—These organs, the functions of which are entirely unknown, but whose structure Boehm has so well described, were ulcerated in the twenty-three cases I am here considering; and as the proof that the lesions of these patches observed in England are the same as those observed in France is of importance for establishing the identity of the cases I have here called typhoid fever with those described by Louis and Chomel under the same name, I must enter a little fully into the description of the changes these patches had undergone in the twenty-three cases here analyzed.

In one of the cases which proved fatal on the *twelfth day*, i. e. the earliest period of the disease at which either of the twenty-three patients died, the following lesions were noted to exist in the ileum. About seven feet above the cœcum, the solitary glands were very distinct, in the form of raised opaque white spots. Six feet above the ileo-cœcal valve, was one of Peyer's patches, the *inferior portion* of which was thickened, and of a pinkish hue; from thence downward every patch was thickened; the amount of the thickness and the superficial extent to which each patch was affected, increased as they approached the ileo-cœcal valve. On one patch, situated about three feet from that valve, the mucous membrane was destroyed at several spots, by as many minute ulcers, each about the size of a pin's head; from this point downward every patch was more or less ulcerated, thickened, and distinctly, and in some places considerably, raised above the level of the surrounding mucous membrane. The lowest elliptical patch was three inches in length, thicker than any above it, covered with thick rugose mucous membrane. On it were several ulcers, the largest irregular in shape, about three lines in diameter, the smallest not bigger than a pin's head. The floors of the ulcers were formed of submucous cellular tissue of a deep yellow colour. The mucous membrane on the diseased patches was of a pale purplish colour, and softened; the minute pits observable na-

turally on the patches, were much more apparent than in the healthy state. The thickening of the patches appeared due to an increase in the thickness of the mucous membrane, and of the submucous cellular tissue, and not to any deposit in the latter. The size and thickness of the solitary glands increased as they approached the ileo-cæcal valve; near this part some were as large as split peas. On the apices of several was a small opaque yellow spot, and on others a minute black point. The mucous membrane between the glands at the lower eighteen inches of the ileum was highly vascular; but neither softened nor altered from its normal thickness. The peritoneum immediately over the diseased patches was of a palish purple colour, finely injected, the vessels running in two directions longitudinally, and transversely, *i. e.* crossing each other at right angles.

The following is the description of the condition of the last three-and-a-half yards of the ileum in a man who died of hemorrhage from the intestines on the *twenty-fifth day* of the disease.

About three-and-a-half yards above the ileo-cæcal valve was one of Peyer's patches, opaque and thickened at intervals; the opacity and the thickening were seen, on section through the substance of the patch, to be due to a white deposit, seated in the submucous tissue. The mucous membrane covering the patch was pale, and of normal consistence. On the next patch were two thickened spots, each three-eighths of an inch in diameter. The deposit in the submucous tissue which caused the thickening was of a pink colour; the mucous membrane covering this patch was pale and softened.

Every patch from the last described, to about half a yard above the ileo-cæcal valve, was more or less thickened. The thickening did not, in the majority of cases, affect the whole gland, but was found in spots only; the portion of the patch between the spots appeared tolerably healthy. Where, however, the whole gland was slightly thickened, then some spots were much thicker than the general mass of the patch; the parts most affected measured about a line and a-half in thickness, and had a pink colour; the thickening being evidently due to a pale friable deposit in the submucous cellular tissue. The mucous membrane covering the whole gland was softer than that adjacent to it; and that over the pink and thickest spots, softer than that over the pale and thinner portion of the patch. The solitary glands, at this part of the intestine, were, generally, scarcely visible; but here and there were a few opaque, and slightly elevated, and two were as large as split peas. The mucous membrane over the two was slightly softened, and decidedly softer at their apices than at their bases. The submucous tissue was of deep red at these spots. About half a yard above the ileo-cæcal valve was a Peyer's patch, much more thickened than those above described. The mucous membrane covering it was of pulpy softness. At its superior part was a round spot with red edges, the centre of which was occupied by an opaque yellow structureless mass, readily detached; by its removal, a thin layer of sub-

mucous cellular tissue was exposed. On the lower part of the patch was a spot about one inch in diameter, thicker than the other parts of the gland, of a red colour, its centre occupied by an ulcer three lines in diameter. The floor of this ulcer was formed of the transverse muscular fibres of the intestine; to its edges, which were jagged, and overlapped the floor, were attached shreds of tough, opaque, deep yellow, sloughy looking matter, similar to that observed at the upper part of the patch, and described above as structureless, *i. e.* to the unassisted eye. Passing downwards there was, a little nearer to the cæcum, another patch of a deep grey colour, having on it an ulcer resembling the last described, but larger and deeper; attached to its edges were, as in the last, opaque yellow sloughs. Water thrown into the superior mesenteric artery welled forth freely from the edges of this ulcer; doubtless from it, therefore, the hemorrhage of which the patient died proceeded.

Every patch from this point to the ileo-cæcal valve was more or less destroyed by ulcers resembling the last described. The solitary glands in this part of the ileum were larger than those in the upper portion.

The patient whose intestine presented the appearances I am now about to describe, died on the *forty-sixth day* of illness from perforation. The appearances illustrate well the process of healing of the ulcers, and also the chronic-atonic ulcers, which often continue long after the fever has run its course, and frequently prove fatal by perforation. I cannot refrain from pointing out to the reader the importance of the knowledge of the existence of these atonic ulcers in a practical point of view, as influencing, that is, the treatment and the prognosis. The lower part of the jejunum and the upper part of the ileum, in this case, had a peculiar opaque appearance; their consistence and thickness were normal. About three feet above the ileo-cæcal valve, at the inferior portion of one of Peyer's patches, was a grey spot, half an inch in diameter; the centre of this spot was pale, smooth, shining, and slightly depressed below the level of the surrounding tissue. There was no puckering around it. This mode of healing of typhoid ulceration of the gut explains the fact, that diminution of the calibre of the intestine never follows the healing of this form of ulcer, as pointed out by Rokitanski. It appeared to be the remains of an ulcer. From this spot downwards, to about eight inches above the cæcum, every patch was more or less diseased, *i. e.*, of a deep grey colour; and on every one were healed, or apparently healing, ulcers. In neither of these healing ulcers was there any free fringe of mucous membrane. Between the patches were some small round superficial ulcers, the floors of which were pale, the edges grey, but not elevated. Nine inches from the ileo-cæcal valve, all the coats of the intestine were perforated, and an aperture from the interior of the bowel into the peritoneal cavity was formed, three-eighths of an inch in diameter. The edges of the aperture were well defined; the mucous membrane around it pale, and slightly softened. Through this opening the contents of the bowel had escaped before death.

The whole of the coats of the gut had been perforated, during life, through the next Peyer's patch, but the faecal matter had been prevented from escaping through the aperture, in consequence of the peritoneal surface around the orifice having adhered, by dense false membrane, to the fundus of the uterus. The edges of the opening, like the remainder of the patch, were grey, and not thickened. On the same patch were two ulcers, the size of the aperture last described; their floors were pale, and formed by the transverse muscular fibres of the gut; their edges scarcely, if at all, elevated, and, like the whole patch, deep grey. On the patch, immediately above the valve, were several small superficial ulcers, and some smooth, pale, shining, and slightly depressed spots, apparently healed ulcers. Between the three last described patches were many small round grey spots. On these there were no traces of previous ulceration; they appeared to have undergone resolution without proceeding to the stage of ulceration. They were scarcely thickened, and the grey colour assumed a deeper tint when the surface of the mucous membrane was removed by gentle friction. This latter is a very important fact with reference to the question, whether the change of colour was cadaveric, or the result of diseased action. The whole mucous membrane of the lower portion of the ileum was pale, rather soft, somewhat opaque, but of normal thickness.

In the following account of the appearances found in the ileum after death, on the 28th day of the disease, are detailed the conditions which precede one mode of perforation, viz., that by *rupture* of the peritoneal coat. The upper part of the ileum was of a pale ash grey, normal in consistence and thickness. About four-and-a-half feet above the ileo-caecal valve was one of Peyer's patches, slightly thickened, the mucous membrane covering it softened, and very vascular. The next patch was similarly affected. On the next, *i.e.*, descending toward the valve, was a large ulcer, by which the coats of the intestine had been so much thinned that an aperture was formed in washing them. From this point downward every agminated gland was more or less destroyed by ulceration. On the floors of some of the ulcers were large sloughs of a yellow colour, soft, but moderately tough; around the edges of others were small masses of pale yellowish deposit, friable, and of cheesy consistence. The floors of the ulcers generally were formed by transverse muscular fibres. From the centre of some of them, however, the muscular fibres had disappeared, and a delicate layer of peritoneum only separated the contents of the intestine from the abdominal cavity. The edges of the ulcers were elevated, and of a grey or slate colour. The mucous membrane, between the agminated glands, was rather pale, and slightly softer than natural. The peritoneum covering the ulcerated patches was more vascular than elsewhere; and on that membrane, corresponding to the floor of some of the ulcers, were some shreds of recent lymph.

I have detailed in the above four cases two forms of thickening of

the agminated glands. One, in which the thickening depended on the deposit of a pale whitish friable matter, of cheesy consistence, *in the substance* of the submucous cellular tissue—the *plaques dures* of Louis; and another, in which the thickening was due to swelling of the mucous and submucous tissues,—the *plaques molles* of the same author. Ulceration follows both forms of thickening.

These cases farther illustrate the following facts:—

1st, That ulceration of the solitary and agminated glands may commence in two modes; on the one hand, by softening of the mucous membrane, abrasion of the extremely softened superficial tissue, and then enlargement of the breach of continuity thus formed, in depth and extent, by simple ulceration; on the other, by sloughing of a portion of the submucous tissue containing the before-described deposit, and of the mucous membrane over it, and then extension of the ulcer in breadth and width, by the separation of minute sloughs from the edges of the breach of continuity, left after the separation of the slough first formed.

2d, That when the whole of the deposit has sloughed out, no fresh deposit is formed; and that, consequently, as the whole of that deposit is seated in the submucous tissue, destruction of the muscular fibres of the intestine must be the result of simple ulceration.

3d, That resolution of the disease affecting the patches may in some cases occur before ulceration has taken place.

4th, That ulcers of considerable size may heal.

5th, That no contraction follows, within a short period, the healing of the ulcers.

6th, That ulcers, dependent for their origin on the presence in the system of the fever-poison, may, after the fever has run its course, continue to spread, retard recovery, and even cause death by perforation.

7th, That while some of the ulcers are undergoing the healing process, others may be spreading; or, as Rokitanski says, may pass into the state of atonic ulcers.

These atonic or simple ulcers, left after the termination of the fever, are a frequent cause of lengthened duration of illness in cases of typhoid fever.

Four cases only of twenty-three offered examples of the *plaques dures*.

In no case that proved fatal after the 30th day was any of the whitish deposit discovered in the submucous cellular tissue; and this agrees with the experience of Louis, for the thirteen examples of the *plaques dures* detailed in his great work on Typhoid Fever, proved fatal before the 30th day of the disease. I doubt, however, if it be correct to regard all the cases which proved fatal at a later period as examples of the *plaques molles*, because it is probable that the deposit constituting the *plaques dures* takes place at an early period of the disease.—(I have seen it very extensive in the intestine of a girl who died four days after she had been engaged at the wash-tub, at which

time she felt quite well. I am indebted for the history of the case to my friend Mr Sankey. I saw the girl the last day of life, and was present at the examination after death.)—And it is farther probable, that before the 30th day the whole of this foreign matter, incapable of more than the lowest cell-development, would be thrown off by sloughing.

This view of the matter receives confirmation from the condition of the mesenteric glands in many cases.

From these organs the typhous matter, as it has been called, is not thrown off, as from the agminated glands, by sloughing. In them, accordingly, we find this deposit long after the 30th day. In one of the cases above described, which proved fatal on the 28th day of the fever, had the patient survived another day or two, the few pieces of yellowish cheesy matter which still adhered to the sides of the ulcers would have been thrown off, and there would have remained no proof, that the case had been an example of the plaques dures.

The ulcers, as a general rule, increased in superficial extent as they approached the ileo-cæcal valve. When one portion of a patch was thicker than another, the portion of the patch next the ileo-cæcal valve was usually the thicker.

Healing ulcers were found in every case that proved fatal after the 30th day, and also in one case that *probably* had been ill only twenty days when the fatal termination took place. No effort at separation was discovered in the other cases that proved fatal before the 30th day. Another inducement to believe that the attempt I made to fix the duration of the disease from the duration of the eruption, at the commencement of this paper, was successful.

Perforation.—Three patients, or rather less than one-eighth of the patients whose cases are here analyzed, died from perforation of the intestine, respectively on the 17th, 31st, and 42d day of disease. The perforation in all three took place through the floor of an ulcer seated on one of the agminated glands. In two of the three, perforation occurred in the lower nine inches of the ileum; in one, three feet above the ileo-cæcal valve. In two of the three the coats of the intestine were destroyed through their whole thickness at another spot from that at which the perforation, which proved fatal, took place; but the contents of the bowel had been prevented escaping through the aperture first formed by adhesions, in the one case, to the fundns of the uterus, and in the other, to a fold of the intestine. It will be observed, that in one of the three cases certainly the fatal perforation took place after the termination of the fever.

This fact, as I have before stated, is of the highest practical importance. It is not to be supposed that a case continues to be typhoid fever so long as ulceration, even active ulceration, of the agminated glands exists. The fever, the true fever, runs its course, but having excited, during that course, ulceration or inflammation of any organ or set of organs, that ulceration, or that inflammation, continues to

its termination irrespective of the duration of the specific disease. This appears to me to be the key to much of the difficulty surrounding the study of the duration of continued fevers.

Solitary Glands.—These bodies were visible in six cases, enlarged slightly in three, ulcerated in six, no note of their condition was made in eight cases, so that in these eight they could have deviated little, if at all, from a healthy appearance, *i.e.* could have been scarcely, or not at all, visible. Four of these eight survived the fever. They were generally more diseased in the vicinity of the cæcum than higher up the intestine.

When ulcerated, the breach in the continuity of the mucous membrane over them appeared to take place, either by the formation of minute sloughs on their apices, which, when thrown off, left small ulcers, or by softening of the mucous membrane covering their most prominent part.

Typhus Fever.—Colour.—The mucous membrane of the jejunum and ileum was healthy in colour in thirty-four of the thirty-nine cases of which notes on this point were made; in four, however, of the thirty-four, there was some ramiform injection of the larger vessels, at intervals apparently due to position.

In two cases hemorrhagic spots existed beneath the mucous membrane; in one of the two, these spots, about twenty in number, were scattered over the upper eighteen inches of the jejunum; their size varied from a small pin's head to a line and a half in diameter; the largest were of a deep purple colour, the smaller red. All were hard to the touch, and distinctly elevated. When firmly pressed, their contents, which was fluid, spread irregularly beneath the surrounding mucous membrane. Apparently entering into several of these spots, small vessels, filled with fluid blood, could be traced. The mucous membrane between was pale and of normal consistence; in the other of these two cases, the mucous membrane of the ileum, from four feet above the ileo-cæcal valve to nine inches from the same spot, was finely injected. Some of the larger veins were filled with dark blood, and in their vicinity were small spots of ecchymosis. The mucous membrane itself was rather thin and soft. In one case the jejunum was finely injected, while the ileum was pale; in another, both divisions of the intestine were deep grey; and in another case, the fine injection was limited to the lower part of the ileum.

Consistence.—In twenty-nine cases the mucous membrane was of normal, or nearly normal, consistence; in six, it was generally slightly softened; in one case before referred to, the softening was confined to the lower part of the ileum, the same part being finely injected. The upper part of the jejunum was rather soft in a case in which the mucous membrane of the ileum was normal in consistence. In one case only was there any notable thinning of the mucous membrane, and in that case it was conjoined with softening and redness.

Peyer's Patches, or the Agminated Glands.—With three exceptions, these organs were perfectly healthy, *i.e.*, neither elevated, reddened, softened, nor ulcerated. In fourteen cases they were scarcely visi-

ble; in sixteen they were noted to be visible, and normal in appearance. I have not considered that appearance, likened by French pathologists to the newly shaven beard, as a deviation from health. This condition was observed in four of the above cases. In the other ten instances, the whole intestinal canal was carefully examined, and recorded as *perfectly healthy*, but no note was made as to whether the patches were visible.

The following are the particulars of the appearances presented by the three cases in which the patches deviated from their normal condition. In one case, the patient, a child æt. ten years, died on the forty-fourth day of illness, and the thirty-first of her residence in the hospital. There was found, after death, extensive tubercular deposit in both lungs, and a large gangrenous abscess in the left. About eighteen inches from the commencement of the jejunum, was a Peyer's patch, beneath the mucous membrane of which, *in distinct points*, was some yellow opaque matter; the tissue of the gland between these *points* was healthy in all particulars. The next three or four patches resembled the last described. Then followed six perfectly healthy; then one resembling the first; after which every patch was normal in all respects. The mesenteric glands were enlarged, especially about the centre of the mesentery. On section, some of them were found studded with yellowish white masses, about the size of pins' heads.

This was evidently a case of tubercular disease of the agminated and mesenteric glands. These organs bore *no* resemblance to the same parts taken from a patient who had died at the same period, after recovering from typhoid fever. The situation of the diseased patches and mesenteric glands, the form and nature of the foreign matter deposited in them, and finally, the fact of the whitish matter of the plaques dures, with which alone it could by any possibility have been confounded, never having been seen in the agminated glands after the 30th day, while this patient died on the 44th day of the illness,—all unequivocally prove that this was not a case of typhoid fever; while the general appearance, and the situation of the deposit, and the existence of tubercle in the lung, as undoubtedly prove that it was an example of abdominal tubercular disease.

In the second case, which proved fatal during the fourth week of the disease, the lower eighteen inches of the ileum were intensely congested—the large veins distended with dark blood—the mucous membrane of a dusky vermillion hue, the bodies of Peyer's patches slightly thickened, and of a deeper red than the surrounding membrane. At the same part the mucous membrane was somewhat softened, but not more so on the patches than around them. Some of the mesenteric glands in this case were visible, but not enlarged; the mucous membrane of the caecum, and ascending colon near to the caecum, was highly vascular and softened—the under surface of the ileo-caecal valve an uniform dusky purple red. This case, then, was one of dysentery, in which the inflammation extended somewhat higher up

the ileum than usual, and involved the mucous membrane covering the elliptic patches, *in common* with that around them. The inflammatory action probably commenced at the under surface of the ileo-cæcal valve ; at any rate, that spot deviated the most markedly from a healthy appearance. The third case was that of a woman aged thirty-nine years, who died on the 19th day of the disease. The mucous membrane of the jejunum and ileum was tinged with bile ; the larger vessels were considerably congested. The thirteenth Peyer's patch, counting from the cæcum, was finely injected. The other patches were healthy, with the exception of the last and the last but one, on either of which was a very slightly thickened spot, of a greyish colour, about two lines in diameter, with a minute depression in the centre. The mesenteric glands were visible, but not enlarged ; the mucous membrane over the patches was of normal consistence and thickness, the deviation from health was so trifling, that a friend present, well acquainted with the normal and diseased condition of these organs, considered them healthy ; and I really cannot say, the thickening was so trifling, and the discolouration so pale, that there was any actual disease, but as I noted these appearances at the time, and there was a question whether there was a loss of mucous membrane at the minute depressed points, I have thought it well to give the particulars.

Thus, it may be said, that recent disease of Peyer's patches was absent in every one of the forty-three cases of typhus fever.

Solitary Glands.—There was no deviation from the healthy condition of these organs in any of the cases of typhus fever.

LARGE INTESTINES.

Typhoid Fever.—The large intestines were not examined in three cases ; four proved fatal after the 35th day of the disease, so that so far as the colour and consistence of the mucous membrane are concerned, sixteen cases only are available for analysis.

The colour and consistence of the mucous membrane in ten of the sixteen were normal, or nearly so. In two of the ten there were ulcers on the mucous membrane of both cæcum and colon.

In two cases the mucous membrane of the large intestines was softened throughout ; in one of the two it was pale throughout ; in the other the ascending colon was deeply injected, the remainder of the gut being pale.

In one of the sixteen cases the mucous membrane of the cæcum was pale grey, and normal in consistence and thickness ; the colon in the same subject being bright red, mottled with patches of grey ; in another the lining membrane of the cæcum was slightly softened, the ascending colon, here and there, dull red, and slightly softened, the transverse and descending colon being normal in consistence and thickness ; the cæcum was pale in one case in which the ascending colon, just above the cæcum, was highly vascular, but from that part to its termination, pale. Its consistence in this case was normal.

In the three last cases there were ulcers in either the cæcum or colon, or in both. In one case there was unequivocal evidence of inflammation of the colon. The subject was a man æt. twenty-eight, who died on the 27th day of the disease; the mucous membrane of the colon immediately above the cæcum,—which was pale and healthy in consistence and thickness—was minutely injected, and scattered over the same part were patches of a bright red colour. The mucous membrane at these deeply red parts looked roughened, the minute elevation being of a deeper hue than the floor on which they were seated; on the deepest coloured spots were shreds of lymph-like matter, of a yellowish colour. These patches of shreds had a transverse direction—*i. e.*, ran round the intestine; these shreds were capable of being removed without injury to the subjacent membrane. The mucous membrane itself was neither thickened nor softened, but was capable of being removed in larger and longer strips than usual, probably from softening of the submucous cellular tissue. At this part of the colon the solitary glands were not visible, but farther on they were found without difficulty. They did not appear diseased in any way. There was no ulceration of the large intestines in this case.

Ulceration.—Twenty of the twenty-three cases may be considered with reference to this point—*i. e.*, all those in which the large intestines were examined. In seven of the twenty, ulcers existed in the cæcum or colon, or in both. Generally round and small, they were occasionally oval, and of considerable size; in the latter case their long axis lay in the direction of the circular fibres of the intestine. Sometimes their floors were formed of submucous cellular tissue, at others of muscular fibres, and in one instance by peritoneum only. The following descriptions will show that their first development resembles, in all particulars, the origin of the ulcers observed in the small intestines in the cases here examined. A male, æt. 23, died on the 25th day of the disease; the colon was bright red, mottled with grey; scattered over its whole surface were numerous round spots about a line in diameter, elevated, some of them considerably, above the level of the surrounding membrane. Their centres were white and opaque, their bases grey. The white opaque central spot had, in some instances, separated at its circumference from the surrounding membrane, still, however, adhering to the submucous tissue; the line of separation was deep red. Again, at other places, this line had widened so as to form a complete furrow, the opaque white mass still adhering more or less firmly to the submucous cellular tissue; while in a third set of cases the opaque white mass had disappeared, and a small ulcer had been formed. The elevation of these spots was caused by an opaque white deposit in the submucous tissue. In the descending colon the deposit causing the elevation was greater in amount, and the round spots were larger and stood higher above the surrounding level, than in the parts of the colon near to the cæcum. In another male, æt.

28, who died on the 31st day of the disease, there were about twenty ulcers seated on the four inches of colon immediately adjacent to the cæcum; they were oval, and varied from one-fourth to one-and-a-half inch in length, the largest being one-half inch broad; their long diameter corresponded to the transverse fibres of the intestine. They were situated between the transverse folds of the gut. Their edges were undermined, grey and rounded. Their floors formed of transverse muscular fibres; but in a few places there was little more than peritoneum to prevent the escape of the faecal matter. There was no appearance of solitary glands in this case. In a third case, which proved fatal on the 46th day, the cæcum and ascending colon were thickly studded with ulcers, varying in diameter from one to four lines, the edges of which were scarcely elevated, their floors being formed by submucous cellular tissue, or transverse muscular fibres. In addition to these ulcers, there were interspersed among them numerous opaque white, smooth, shining spots, one or two lines in diameter, the borders of which were grey, the mucous membrane around being slate-coloured, and slightly puckered toward them.

It admits of question whether the ulceration in these cases had its origin in the solitary glands; and although, in the first case, the general appearance of the elevations studding the mucous membrane closely resembled enlarged solitary glands, yet I by no means feel confident that they were such in reality. The analogies of the *plaques molles* and *plaques dures* are clearly seen in the above cases, and the last case exhibits what was seen to be true with respect to ulcers in the small intestines,—viz., that while, after the fever had run its course, some of the ulcers might heal, yet that others might pass into the state of simple ulcers, and prolong the illness to an indefinite period.

Typhus Fever.—The large intestines were examined in thirty-seven cases before the termination of the 4th week of the disease. In twenty-eight of the thirty-seven the mucous membrane lining them was normal, or nearly so, in colour and consistence.

In one case the cæcum, in one the cæcum and colon generally, and in one the cæcum and ascending colon, were congested. The congestion, though marked, was confined to the larger vessels, and was ramiform in character. In one case the cæcum and colon were pale, but slightly softened; and in one the softening was limited to the transverse arch.

In four cases only were unequivocal traces of inflammation of the mucous membrane of the large intestines present. A female, aged twenty-nine, died toward the end of the third or during the fourth week of the disease. The appearances found after death in the intestine have already been described. In another of the four cases, the patient, a woman, aged forty-seven, died on the 12th day of the disease. In the colon, just above the cæcum, were four large patches running transversely, of a deep red colour; the mucous membrane at this part was thickened, and decidedly softer than that around.

Although it was in this case rather softer throughout the colon than usual, still it was not more so generally than might be considered within the range of health. With the exception of the patches, just described, the mucous membrane of the large intestine was pale. The third case also was that of a woman, aet. forty-three, who died on the 16th day of the disease. Scattered over the eighteen inches of colon next the cæcum, there were about twenty patches, varying from one-quarter to half-inch in diameter, irregular in shape, of a dull yellow colour, considerably elevated. The mucous membrane which immediately surrounded them was of a bright red colour, gradually fading as it receded into the natural hue of the intestinal mucous membrane. The yellow matter itself was readily removable, friable, and finally granular. It appeared to be a deposit of lymph in and on the mucous membrane, a portion of the latter being carried away when the former was removed. In the transverse and descending colon were a few linear patches, resembling the yellow spots above described. Some of these ran transversely, others longitudinally; the latter appeared in some measure to correspond in course and situation to the longitudinal bands. The mucous membrane of the colon generally was rather soft, of normal thickness, and pale. The fourth case in which there were signs of inflammation of the mucous membrane of the colon, was that of a male, aet. thirty. In the sigmoid flexure was a patch, about four inches in diameter, of vivid redness; the mucous membrane at the same part was decidedly softened. With these four exceptions, there was no trace of inflammation of the mucous membrane of the large intestines.

The frequency of dysentery as a complication of typhus fever, when patients are placed in unfavourable circumstances, ought to make us particularly careful in admitting such evidence (excepting M. Landouzy's¹) as Gaultier de Claubrey has adduced in support of

¹ I may here briefly observe, that M. Landouzy appears to have had, in the prison at Rheims, cases both of typhus and of typhoid fevers. The presence of petechiae by no means proves that a case is not typhoid fever. Petechiae may occur in scarlet fever, small-pox, and in many other diseases (as all who have witnessed much of these affections will readily allow), when the patients are placed in unfavourable circumstances, and occasionally even under other conditions. There is no proof that the mulberry or true typhus rash was present in M. Landouzy's cases, or that true rose spots ever passed into petechiae; nay, it is even within the range of probability that some of the so-called petechiae were really flea-bites. Similar circumstances favour the spread of typhus and typhoid fevers. The poison of both appears subject to the same laws of development; therefore, where one exists there the other is likely to exist. The apparent discrepancies in the observations of the older writers on camp and jail fevers may probably be explained thus:—Their descriptions of the disease varied, because they had at least two diseases to describe, each capable of assuming a mild or a severe form. Now, the varied proportions in which these two diseases prevailed at different times, the presence of one disease only in the camp or jail, and variations in the severity of type, must have necessarily caused confusion in the accounts of camp and jail fever. The same confusion,

the opinion, that the typhus fever of camps and jails of old writers, and typhoid fever, are identical. For we see, even by the examples here brought forward, that lesions of a very serious nature may affect the intestinal mucous membrane in typhus fever; but, at the same time, we see also that these lesions are of a very different character from those occurring in typhoid fever. Therefore, to show that petechiae, diarrhoea, and delirium, were present during life in a number of cases, and that some lesion of the intestine was found after death in the same cases, is by no means to prove that these persons died of typhoid fever. The cases here analyzed, like those recorded by previous writers, prove that neither typhoid nor typhus fever is gastro-enteritis.

MESENTERIC GLANDS.

Typhoid Fever.—These organs were more or less extensively and unequivocally diseased in all of the twenty-three cases I am considering. In every case they were larger than natural, and their volume increased as they approached nearer to the ileo-cæcal valve.

Their size varied from a pea to a pigeon's egg; their colour from pale rose to dark grey; their consistence from firm to soft and flabby, and soft and friable. The deep grey of these organs, with one exception, was limited to those cases which proved fatal after the 30th day. The four cases, also, in which they were recorded to be flabby, all proved fatal after the same date of the disease.

In three cases one or more glands were in a state of suppuration.¹ In two of the three the purulent-looking fluid, collected in a mass, was separated from the abdominal cavity only by a thin layer of peritoneum. In the third the purulent fluid occupied distinct points in the glands. Two of these three cases proved fatal respectively on the 20th and 30th day, the third at least five weeks after the commencement of the disease.

In a fourth case, in which probably the suppurative process took place, the patient recovered, so far as the fever was concerned, and the glands were reduced at the time of death to a state in which they could no longer have exercised any injurious effect. The patient died of erysipelas, on the 86th day of illness.²

from the same cause, exists in the descriptions of typhus fever by the writers of our own age, who have not drawn the distinction, which nature has, between typhus and typhoid fevers. The attempt to settle the question of the identity or non-identity of these diseases by a reference to old writers, appears as absurd as it would be for astronomers of the present day, with eyes in their heads, telescopes in their hands, and the heavens above them, to found their opinions respecting the movements of certain celestial bodies on the dicta of Ptolemy, or the observations of Copernicus.

¹ Though resembling in external characters true pus, this fluid differs considerably when seen by the aid of the microscope.

² For particulars of this very interesting case, I must refer the reader to the "Medical Times" for the present month. The observation is too long to introduce here.

In four cases there was a deposit of opaque pale yellowish friable matter in the substance of the mesenteric glands. This appeared to be exactly the same material as that seated in the submucous cellular tissue, corresponding to Peyer's patches; and microscopic examination demonstrated the identity of the minute structure of the two deposits. Three of the four cases in which this deposit was found proved fatal respectively on the 12th, 25th, and 46th days; the fourth at least five weeks after the commencement of illness, and three weeks after the admission of the patient into the hospital.

That the before-referred to pseudo-suppuration sometimes occurs around this deposit, the annexed description of the appearances found after death in the mesentery of a man, aged thirty-three, who died on the 20th day of the disease, will, it appears to me, afford sufficient proof. The mesenteric glands were considerably enlarged. They varied in size from a pea to a walnut; just behind the cæcum was a mass, the size of a large pigeon's egg. Externally they were of a deep slate grey. On dissection, a considerable quantity of reddish purulent-looking fluid escaped from them. In the centre, and quite detached and loose, and bathed on all sides by this purulent-looking fluid, was a solid mass, in one of the largest glands about the size of a small walnut, of a delicate pink colour, finely granular externally, and on section firm and friable. In some of the glands the disorganising process appeared to have proceeded further. The central solid pink mass being replaced by a semi-purulent clot. Microscopic examination demonstrated this mass to be made up chiefly of typhous matter, as it has been called.

The mesocolic glands were noted to be enlarged in five cases, in one the enlargement was limited to the vicinity of the colon adjacent to the cæcum, and these glands, which were dark-red and softened, contained some purulent-looking fluid.

In the case in which there was extensive ulceration at the lower part of the œsophagus, there was considerable enlargement of the corresponding *œsophageal lymphatic glands*.

In two cases the *lumbar glands* were enlarged.

Typhus Fever.—In one case, that of a child, æt. 10, in whose lungs and agminated glands numerous tubercles were found, the mesenteric glands varied in size from a pea to a small bean, the largest corresponded to the middle of the small intestine. These glands contained some tubercular matter.¹ In the same case the mesocolic glands were dark grey and firm, and some of them were as large as peas. In another case, that of a child in whose lungs was found some tubercular deposit, the mesenteric glands were large and pale.

With these two exceptions, no deviation from a healthy structure was observed in the mesenteric or other lymphatic glands, in either

¹ See page 1111.

of the forty-three subjects dead from typhus fever. So that patients labouring under typhus fever are exempt from acute disease of the lymphatic glands, at least to any appreciable extent. How much they differ in this respect from those affected with typhoid fever, I need not here point out.

PERITONEUM.

Typhoid Fever.—In five of the twenty-three cases, there were signs of peritonitis, *i.e.* increased vascularity, with effusion of turbid serosity and lymph, or recent adhesions. In four of the five cases, the inflammation had extended over nearly the entire surface of the peritoneum. In three cases, perforation of the coats of the gut appeared to have been the cause of the inflammation. In a fourth case, the co-existence of perforation was a matter of doubt, as I was not permitted to complete the examination. In the fifth case, the peritonitis depended for its origin on perforation of the peritoneum covering a gland in the process of recovery from a state of suppuration.¹

Typhus Fever.—In no case was there any trace of recent peritonitis.

SPLEEN.

Typhoid Fever.—Weight.—Excluding the cases of the subjects under fifteen years of age, those which survived the 35th day of disease, and those the spleens of which were not weighed, there remain only eleven cases for analysis. The average weight of the spleens in these eleven cases was 10 oz. 3 drms. avoirdupois; neither of them weighed less than 6 oz., two exactly 6 oz. each, and one as much as 14 oz.; the patients from whom the two former were obtained, died respectively on the 21st and 31st day of the disease, the last on the 27th.

The size of the organ was nearly in proportion to its weight; its vertical measurement varied from four and a-half to seven inches.

*Consistence.*²—The condition of the spleen with reference to its consistence, was recorded in fourteen cases that proved fatal before the 35th day. In four of these fourteen cases, it was decidedly softened, in one of the four pulpy; these four cases terminated respectively on the 23rd, 25th, 27th, and 28th day of disease. In the remaining ten cases the spleen was of normal consistence; these ten cases terminated respectively from the 12th to the 34th day inclusive.

¹ This case has been before referred to, and is detailed in the "Medical Times" for the present month.

² In examining the consistence of an organ, there is no certain standard of comparison; so that what one observer terms normal in consistence, another may call softer than natural. It is evident that the term of expression will vary according to each man's own idea of what the normal consistence of any given organ is. I have endeavoured to restrict my application of the term softening, to those cases regarding which there could be no difference of opinion.

It is worthy of remark, that seven of the fourteen cases terminated fatally between the 20th and 31st days ; and that it was in this group that the four cases of softening of the spleen were found. Now this is the period of the disease in which M. Louis found the organ the most frequently softened.

Relation between Enlargement and Softening of the Spleen.—The four spleens which were decidedly softened, weighed respectively 11 oz., 13 oz., 13 oz. 4 drms., 14 oz.

Two of those which were as firm as in health, 11 oz., and 12 oz. 4 drms., the patients from whom these two were removed, died on the 12th and 20th days of disease. The others less than 10 oz. ; two of them only 6 oz., these two died respectively on the 21st and 31st day of disease.

Typhus Fever.—The spleen was weighed in thirty-four of the forty-three subjects aged more than fifteen years, who died before the termination of the fourth week of disease.

Its average weight was 7 oz. 5 drms.

In nine, or rather more than one-fourth, of these thirty-four cases, it weighed less than 6 oz. In one case only 2 oz. 6 drms.

In seven, or rather more than one-fifth of the cases, its weight was greater than the average weight of the same organ in the case of typhoid fever. In two cases it weighed as much as 14 oz.

Its size was usually in proportion to its weight. Its vertical measurement varied from four to seven inches.

Attempt to determine the co-existing conditions which favoured enlargement of the spleen.—*Sex.*—Of the above thirty-four cases, seventeen were males, and seventeen were females.

The average weight of the spleen in the seventeen males, was 7 oz. 2 drms. Four of the seventeen spleens removed from the male subjects, weighed less than 6 oz., two more than the average weight of the typhoid spleens, one as much as 14 oz., one as little as 2 oz. 6 drms.

If the male cases which proved fatal before the 21st day only be taken, the average weight of the spleen in them was 8 oz. 2 drms., one only weighing less than 6 oz., and two more than the average of the typhoid spleens.

The average age of these seventeen males, was forty-six years eight months, the eldest was sixty-five, the youngest twenty-nine ; eight of them were under fifty years of age.

The average weight of the spleen in the seventeen females, was 8 oz. 4 drms., five of these seventeen spleens weighed less than 6 oz., and five more than the average weight of the typhoid spleens. The heaviest weighed 14 oz. 4 drms., the lightest 3 oz. 4 drms.

If the cases (female) which proved fatal before the 21st day only be taken into the calculation, then the average weight of the organ was 7 oz. 2 drms., five of the spleens weighing less than 6 oz., and three more than the average weight of the typhoid spleens.

The average age of these seventeen females was 43 years 9 months—the age of the eldest was 70, of the youngest 22 years—ten of the seventeen being under 50 years of age.

Thus it is evident that sex exerted no influence over the size and weight of the spleen in these thirty-four cases.

Age.—The spleens of thirteen subjects between the ages of 16 and 40 inclusive, were examined before the termination of the 4th week from the commencement of the typhus fever. The average weight of the organ in these thirteen cases was 9 oz. 1 drm.—two of them weighing less than 6 oz.; six, or nearly one half, more than 10 oz. 3 drms, *i. e.*, the average weight of the spleen in those dead from typhoid fever.

The spleen was weighed in nineteen cases, the ages of which varied from 41 to 70 years inclusive. In these nineteen the average weight of the organ was only 6 oz. 6 drms.; six, or nearly one-third, weighed less than 6 oz.; one only weighed more than the average of the typhoid spleens.

Thus the age of the patients appears to have exerted an appreciable influence over the size attained by the spleen in the cases of typhus fever.

If, instead of taking the average of the spleen in these thirty-four cases, the weight of the organ in the subjects the ages of which corresponded with the ages of the cases of typhoid fever here analyzed, *i. e.*, were under 40 years, be considered, and these cases be still further limited to those which proved fatal before the termination of the 21st day of disease, then there will be nine cases for examination, and the weights of the spleens in these nine will nearly correspond with the weights of the same organ in the cases of typhoid fever,—thus the average weight of the organ in these nine cases was 10 oz. 4 drms., none weighing less than 6 oz., and six over the average of the weight of the same organ in the cases of typhoid fever.

But if the cases of the patients between 40 and 50 years of age, who died by the 21st day of the disease, only be considered—there were eight of them—the average weight of the spleen in these eight cases was 6 oz. 4 drms., and while four of the spleens weighed less than 6 oz., only one exceeded in weight the typhoid spleens.

The spleens of eight patients, whose ages exceeded 50 years, and who died before the 21st day of disease, were weighed. The average weight of the organ in these eight cases was 7 oz. 1 drm., one only weighing less than 6 oz., and none more than 9 oz.

Consistence.—The consistence of the spleen was notably diminished in thirteen cases. In these cases its consistence was characterised by the terms—pulpy, very soft, soft, rather soft.

In eighteen cases it retained its normal consistence. In these cases it was stated in my notes to be firm, healthy in consistence, or moderately, or tolerably firm, or not decidedly softened.

In the remaining twelve cases, there was either old disease of

the organ present, or the patients survived beyond the 4th week of the disease, or the consistence of the organ was not noted.

Influence of sex—season—local complications—cadaveric change—condition of the blood—age—and duration of the disease in determining the presence or absence of softening of the spleen.

Sex.—Nine of the eighteen subjects in which the spleen was of good consistence were males; 9 females.

Six of the thirteen in which it was softened were males; seven females.

The proportion of males to females, in both instances, was, therefore, as nearly equal as was possible, so that sex exerted no influence in producing softening of the spleen.

Season.—Seven of the eighteen subjects, the spleens of which were of normal consistence, were examined during the 6 winter months, eleven during the 6 summer months.

Six of the thirteen subjects, in which the same organ was softened, were opened during the 6 winter months, seven during the 6 summer months. The latter, therefore, are in as nearly equal proportion as is possible, seeing the total is an odd number. Thus season, like sex, had no part in causing the change in the consistence of the spleen.

Local Complications of an Inflammatory Nature.—These appeared to exert little influence on the consistence or size of the spleen. Five of the eighteen cases in which that organ was firm, were uncomplicated, and four of the thirteen in which it was softened.

Was the Softening the effect of a Cadaveric Change?—Three of the cases in which the spleen was very soft, or soft, were examined respectively 8, 9, and 11 hours after death, and only three of the thirteen cases more than 30 hours after death, while eight of seventeen cases, in which the spleen was of normal, or nearly normal consistence, were examined more than 30 hours after death.

It appears highly probable that this change, then, was pathological and not cadaveric; for although the subjects, the spleens of which were so decidedly softened 8, 9, and 11 hours after the fatal termination, were examined in the months of July and September, yet the temperature was noted to be cool at the time the two former lay dead.

Relation between Softening of the Spleen and the Condition of the Blood.—Of six cases in which the blood was fluid, or in which there was merely a little soft black clot in the right side of the heart, two had the spleen soft, and four firm, and as there were eighteen of the latter to thirteen of the former, this condition of the blood could have exerted little influence in producing the variations in the consistence of the spleen.

Age.—Of the thirteen subjects in which the spleen was noted to be of normal consistence or firm, there were—

Aged 30 years and under,	5 i.e.	$\frac{5}{13}$	or in the proportion of	38.46 per cent.
... between 31 & 40 incl.,	3	$\frac{3}{13}$	...	23.07 per cent.
... ... 41 & 50	4	$\frac{4}{13}$	...	30.77 per cent.
... ... 51 & 62	1	$\frac{1}{13}$	...	7.68 per cent.

If to these be added the five subjects in which the organ was noted to be of tolerably firm, &c., consistence, there will be—

Aged 30 years and under,	6 i.e.	$\frac{6}{18}$	or in the proportion of	33.33 per cent.
... between 31 & 40 incl.,	4	$\frac{4}{18}$	...	22.22 per cent.
... ... 41 & 50	5	$\frac{5}{18}$	...	27.77 per cent.
... ... 50 & 65	3	$\frac{3}{18}$	...	16.66 per cent.

Of the thirteen subjects, the spleens of which were *decidedly* softened, there were—

Aged 30 years and under,	1 i.e.	$\frac{1}{13}$	or in the proportion of	7.68 per cent.
... between 31 & 40 incl.,	2	$\frac{2}{13}$	...	15.38 per cent.
... ... 41 & 50	4	$\frac{4}{13}$	...	30.77 per cent.
... ... 51 & 62	6	$\frac{6}{13}$	...	46.15 per cent.

So that, of the spleens undoubtedly softened, rather more than three-fourths belonged to subjects more than forty years of age, and nearly one-half to subjects more than fifty years of age; while of the spleens, the consistence of which was as firm as in health, decidedly less than half were removed from subjects more than forty years of age, and one only from a subject more than fifty years of age; and if to the latter group be added the five in which the consistence was so slightly diminished as not to be considered abnormally so, still less than half were removed from subjects the ages of which exceeded forty, and three only from subjects more than 50 years of age.

Duration of the Disease.—Fifteen spleens of normal or nearly normal consistence, were removed from subjects, the duration of the disease in which was known. Of these fifteen spleens there were,—

Belonging to subjects who had been ill a period not exceeding 14 days, 5
 between 14 and 29 days, 10

Of ten spleens noted to be decidedly softer than natural, there were,—

Belonging to subjects who had been ill a period not exceeding 14 days, 7
 between 14 and 17 days, 3

and not one of the four subjects in which this organ was noted to be *very* soft, had survived the 14th day of the disease.

Relation between the weight and consistence of the Spleen.—Twelve of the softened spleens were weighed, of these,—

3 or one-fourth weighed less than	6 oz.
11 less than	... ... 9 oz.
1	... ... ... 11 oz. 4 drms.

Sixteen of the spleens of normal consistence were weighed, of these,—

3 or rather less than one-fifth	weighed less than	6 oz.
8 or one-half more than	...	9 oz.
2 as much as	...	14 oz.

So that the smaller spleens appear to have been the softer.

From this rather lengthened analysis it is evident,

1.—That the spleen was considerably enlarged in the cases of Typhoid and Typhus fevers here analyzed.

2.—That it is generally larger in the subjects dead from Typhoid, than in those dead from Typhus fever.

3.—That if the cases of Typhus fever be limited to those, the ages of which do not exceed forty years, then the relative difference in the weight of the spleen in the cases of Typhoid and Typhus fevers, which prove fatal respectively before the 35th, and the 28th day of the disease is considerably diminished.

4.—That the average weight of the organ is exactly equal in subjects dead from Typhoid and Typhus fevers, if the cases of the latter disease only be considered, which prove fatal before the 21st day of the disease, and which do not exceed forty years of age, *i. e.*, the age after which no case of Typhoid fever (here analyzed), proved fatal.

5.—That after the age of forty, the spleen is much less enlarged in Typhus fever than it is before that age. How far this holds true with regard to Typhoid fever, the cases here considered afford no means of determining.

6.—That softening of the spleen in cases of Typhus fever is much more frequent after the age of fifty, than before that period of life.

7.—That softening of the spleen both in Typhoid and Typhus fevers, is much more frequent in those cases that terminate unfavourably at an early period of either disease, than in those which prove fatal at a later period.

8.—That in no case of Typhoid fever (here analyzed), was the spleen found softened, after the 28th day of the disease.

9.—That softening of the spleen is much more frequent in cases of Typhus fever before, than after the 14th day of the disease.

We may therefore conclude that the age of the patient, and the duration of the disease are the two circumstances which exert the greatest influence in determining the presence of softening and of enlargement of the spleen in Typhus and Typhoid fevers.

LIVER.

Typhoid Fever.—Excluding eight cases, in which the liver was not examined, or which proved fatal after the 35th day of the disease, there remain fifteen for analysis.

Seven of the fifteen were opened during the first 24 hours; eight between 24 and 58 hours after death: six during the winter, nine during the summer months.

In eleven of the fifteen the consistence of the liver was normal; six of these eleven cases were examined during the first 24 hours

after death, the remaining five between 24 and 44½ hours; five of the eleven were examined during winter months, six during the summer.

In four of the fifteen—*i. e.*, about one-fourth—the liver was flabby; these four were examined respectively 11, 26, 32, and 58 hours after death, in the months of September, August, September, and January. The four cases proved fatal respectively on the 31st, 7th, 28th, and 30th days of disease.

In one of the four cases only was the organ noted to be of a doughy consistence—*i. e.*, it accepted and retained the impression of the fingers with facility. This was the third of the four cases above-mentioned.

The colour was noted to be normal in thirteen cases; darker than usual in two cases—*i. e.*, about one-seventh.

Typhus Fever.—Seven of the forty-three cases are ineligible for analysis.

Seventeen of the remaining thirty-six cases were opened during the first 24 hours after death; nineteen between 24 and 52 hours: sixteen were opened in the winter, twenty-five in the summer, months.

In fourteen of the thirty-six cases the liver retained its normal consistence; eight of these fourteen were examined within 24 hours, and five between 24 and 36 hours, after death: five during the winter, and nine during the summer, months.

In twenty-two, or three-fifths of the cases examined, the liver was flabby. Nine of the twenty-two were examined during the first 24 hours after death, thirteen between 24 and 52 hours after death: seven were examined during the winter, fifteen during the summer, months.

In seven of these twenty-two cases—*i. e.*, in one-fifth of the whole number of cases examined—the liver was of doughy or putty-like consistence. Six of the seven were examined between 22 and 36 hours after death: three during the winter months, four during the summer. Five of these seven died on or before the 14th day of disease; two at an uncertain period of the disease, but on the 3d and 6th days of their residence in the hospital, and therefore probably at an early period of the disease. While of twelve cases, the duration of which was known, and in which the liver was firm, or of normal consistence, eight—*i. e.*, two-thirds—survived the 14th day of the disease.

The colour of the liver was normal in twenty-nine of the thirty-six cases; deeper than natural in seven—*i. e.*, one-fifth.

The question examined above, it will be observed, is not that of the *absolute* cause of the softening of the liver in typhoid and typhus fevers, but that of the existence of external conditions, capable of accounting for the actual *difference* observed in the condition of the organ in the two diseases.

It will be seen, then, that about half the cases of either disease

were examined during the first 24 hours after death, and, as near as possible, two-thirds of either disease during the summer months. The difference in the proportions of the cases in which marked alteration in the consistence of the organ occurred cannot, then, be attributed to any difference in the periods at which the cases of the two diseases were examined after death, nor to any difference in the temperature. Like the same change in other organs, as the kidneys and pancreas, it was probably the effect of the difference in the alterations in the solids induced by either disease, which difference was only manifested by the rapidity, &c., of the cadaveric changes.

GALL-BLADDER.

Typhoid Fever.—Notes were taken of the gall-bladder and its contents in fourteen cases, which proved fatal before the 35th day of disease.

In two cases only was the bile distinctly green, and in both it was thin and limpid. In four cases it was greenish yellow; and in eight cases yellow or orange.

In one case, which proved fatal on the 46th day of disease, two ulcers were found in the gall-bladder.

Typhus Fever.—The physical appearances of the bile were recorded in thirty-one cases.

In nine of them it was dark green; in nine greenish yellow; and in twelve yellow or orange.

In addition to this difference in hue, the bile was generally much thicker in typhus than in typhoid fever.

In no case of typhus was there any ulceration of the lining membrane of the gall-bladder.

PANCREAS.

Typhoid Fever.—This organ was examined in thirteen of the twenty-three cases. In four it was flabby; in nine of normal consistence. In all it preserved its natural colour.

Typhus Fever.—In eight of thirty-four cases in which the pancreas was examined, that organ was flabby; in the remaining twenty-six it was normal in consistence. In eight cases it was deeper red than natural; in twenty-six it preserved its healthy hue.

KIDNEYS.

As the amount of blood in these organs could have caused but little change from their normal weight, and the cases I am here considering are limited in number, I shall not enter on that subject, although I have notes of the weight of the kidneys in sixty of the sixty-six cases here considered.

The microscopic examinations I shall also reserve for some other occasion. It is sufficient to say that such examinations exhibited a

marked difference in the structure (after death) of the kidneys in the two diseases. In the one (typhus) the tubes were in a much larger proportion of cases than in the other (typhoid fever) filled with detached epithelium scales. This separation I regard as cadaverie, and a part of that general tendency to the dissolution of tissue so eminently characteristic of typhus fever.

Typhoid Fever.—The kidneys were noted to be healthy in eight cases, congested in three, and pale in three. Of two others no note was made, so that they could have deviated but little in appearance from health.

Seven cases either survived the 35th day of disease, or those organs were not examined.

Consistence.—Excluding the above seven cases, the kidneys were noted to be flabby in one case, examined $47\frac{1}{2}$ hours after death, in the month of October. In the other cases they were normal in consistence—at least they were recorded to be healthy.¹

In two cases there was slightly increased vascularity of the lining membrane of the pelvis of the kidney.

The *urinary bladder* was examined in nine cases which proved fatal before the termination of the fever. In one case only did it present any deviation from health. The following is a description of its appearance:—Scattered over the mucous membrane of the organ were numerous patches of deep red, and here and there patches of a dull yellow, slightly elevated, smooth on the surface, and surrounded by an areola of deep red. When the yellow matter was removed by the nail, a slightly abraded surface was exposed, as if the mucous membrane had been carried away with it.

Typhus Fever.—Both kidneys were congested in eight cases; the left kidney only in one case. In twenty-seven cases they were considered healthy in appearance.

Consistence.—In five cases they were recorded to be flabby, or soft and flabby, in consistence. These five cases were examined respectively 16, 22, 27, 36, and 38 hours after death, and in the months of December, November, October, and May.

In thirty-one cases they were healthy.

In four cases the lining membrane of the pelvis was considered to be more injected than natural. In one of these cases it was studded with minute hemorrhagic points.

Seven cases either survived the fever, or were not examined.

The *urinary bladder* was examined in twelve cases which proved fatal by the 28th day of the disease. In one there was found congestion of its posterior wall, with numerous minute hemorrhagic spots in the same situation. In another the mucous membrane

¹ In every case recorded as healthy, the capsules were removed from the surface, and the kidney divided longitudinally.

generally was slightly more vascular than natural. While in a third case the anterior wall of the viscus was very finely injected.

In the remaining nine cases the organ was pale and healthily.¹

PERICARDIUM.

Typhoid Fever.—In one case only was any deviation from the normal condition of the pericardium observed. In that case a few shreds of lymph were attached to the pericardium, covering the auricle. In every case the fluid retained the yellow hue proper to it, and its amount was considered natural.

Five of the cases were examined, respectively 30, 32, 36, $44\frac{1}{2}$, and 58 hours after death; three in the summer and two in the winter months.

Typhus Fever.—Excluding seven cases not eligible for analysis, there remain thirty-six for consideration.

In thirty-one cases no abnormal appearance was observed.

In five the serosity contained in the pericardium was of a more or less deep red colour. These five cases were examined, respectively 16, 24, 24, 40, and 48 hours after death: four during the summer, and one during the winter, months. That the red hue was due to the transudation of the colouring matter of the blood, and not the consequence of effusion of blood, was proved by its containing no red corpuscles, by the number of epithelium scales diffused throughout it, by the deep red staining of the posterior wall of the auricles, and by a shade of discolouration bounding the edges of the veins coursing over the surface of the heart.

This cadaveric transudation of a solution of the colouring matter of the blood into the serosity contained in the pericardium, is another example of the greater tendency to decay impressed on the body by typhus than by typhoid fever; for it may be observed, that the period that elapsed after death, before the above five cases were examined, was exceeded by that before which five of the cases of typhoid fever were opened. One of the former, in fact, was inspected in the month of December, only 16 hours after death. Three of these five patients were less than forty years of age; the one last referred to was only twenty-two, so that neither difference in age, nor external conditions, was the cause of the want of similarity between the two diseases with respect to the change under consideration.

HEART AND ITS CONTENTS.

Typhoid Fever.—Excluding those cases in which the chest was not examined, and those which survived more than 35 days from the outset of the disease, there remain for analysis fifteen cases.

¹ Subsequent experience would lead me to suppose that I noted some kidneys as healthy which ought to have been regarded (comparatively) as softened.

In no case was there any recent endocardial disease ; in one there was a congenital malformation, a communication between the right and left ventricles ; and in another, slight thickening of the free edge of the mitral, and induration of the base of the aortic valves.

The substance of the heart was firm or healthy in consistence in five cases ; soft and flabby, or flabby only, in five cases ; the right ventricle flabby, the left normal, in one case ; of four cases no note on this point was made.

Of the five hearts that were flabby, one was examined an uncertain period after death ; the other four respectively, 11, 22½, 32, and 36 hours after the fatal termination. The case in which the right side was flabby, and the left firm, was opened 27 hours after death ; while the five subjects in which the substance of the heart was firm and normal in consistence, had been in the dead-house respectively 24, 30, 42½, 44½, and 58 hours.

The four hearts of which no note on the point here examined was recorded, were probably healthy in consistence, because other facts respecting them were noted. These four cases were examined within 20 hours after death.

The duration of the disease in the five in which the heart was flabby, was respectively 12, 21, 23, 25, and 28 days ; in five cases in which it was firm, 20, 27, 30, 30, and 34 days ; one case had lasted an uncertain time. In the four cases in which it was probably healthy, 17, 30, 32, and 33 days.

Thus four out of five cases in which the heart was flabby proved fatal by the 25th day of the disease, while only one out of nine of those in which it was firm, died so soon as the 25th day of disease. It will be remembered, that the only two cases of typhoid fever in which the cadaveric rigidity had entirely disappeared, proved fatal before the 25th day of disease. This seems to place the two series of facts in the same order.

Of six cases examined during the six winter months, the substance of the heart was flabby in only one ; of eight examined during the summer months, it was flabby in four.

Dusky-red Staining of the Lining Membrane of the Heart.—No note with reference to this particular was made in seven of the cases ; in five cases it was unstained ; in one there was slight discolouration of the endocardium of the left auricle, and in two cases there was slight staining of the whole endocardium ; so that in one-fifth only of the cases was the endocardium observed to be stained, and in these cases the description of the staining was qualified by the terms—slightly, slightly, and a little.

Condition of the Blood in the Heart.—Of fifteen cases eligible for analysis, no note was made in one. In four, examined respectively 58, 36, 22½, and 7 hours after death, the blood was fluid ; in the last, however, it coagulated shortly after its escape from the body ; and there was already formed a minute clot in the right ventricle.

'There was a large clot, made up of a larger or smaller smooth, shining, yellow, fibrinous portion, from the substance of which much serosity could be pressed, and of a large, loose, dark crimson, almost black clot, joined to and lying beneath the former, in the right auricle and ventricle in ten cases; in all of these cases there was also a similar but smaller clot on the left side; and in seven of the ten cases, the fibrinous portion of the coagulum on either side of the heart was continuous with a clot in the pulmonary artery and aorta; and in several of these ten cases it was moulded at the lower portion to the shape of the upper surface of the sigmoid valves.

In four cases the blood was fluid in the venæ cavæ and pulmonary veins, while it was tolerably firmly, or decidedly firmly, coagulated in the right side of the heart.

In two of the three cases in which the blood was fluid in the heart, and did not coagulate after its escape from the body, the substance of the heart was flabby; in two other cases, in which a similar condition of that organ existed, the blood was firmly coagulated; and in five cases, in which it was firm, a firm coagulum was found in the right and left cavities of the organ.

Typhus Fever.—Eight cases either survived beyond the 29th day of the disease, or the chests were not examined.

Excluding six cases, the hearts of which were examined respectively 11, 20, $27\frac{1}{4}$, 36, $45\frac{1}{2}$, and 48 hours after death, because no note with reference to their consistence was made, there remain for analysis twenty-nine cases; in fifteen of these the heart was flabby, in fourteen firm.

Of five hearts examined 20 hours or less after death, one only was flabby; of fourteen examined between 20 and 30 hours after death, four, or more than a fourth, were flabby; while the whole of those, *i. e.*, nine, examined more than 30 hours after death, were in that condition. While, as I have said, above two-thirds of the hearts examined more than 30 hours after death from typhoid fever, were firm or of natural consistence; or if, as is highly probable, those hearts of which no note was made were firm, then it will be seen that four-fifths of the hearts of the subjects dead from typhoid fever, which were examined more than thirty hours after death, were firm; while one-fourth only of the hearts of the subjects dead from typhus fever, which were examined more than 30 hours after death, were firm.

The day of the disease on which those cases proved fatal in which the heart was flabby, varied from the 9th to the 23d day; a large majority of these patients died by the 16th day. The day of the disease on which those cases in which the heart was firm expired, varied from the 11th to the 22d day; the large majority proved fatal by the 15th day, so that the duration of the disease could have had no material influence in producing the flabby condition of the heart. As I have shown above, the duration of the disease had a marked influence over the condition of the heart, with reference to the point we are considering, in the cases of typhoid fever.

Age had very little influence in modifying the consistence of the organ in typhus fever, for the average age of the group in which the heart was flabby, was 44; of that in which it was firm, 47; in the latter group, there were six cases under 50 years of age; in the former, nine under the same age.

The external temperature, like the age of the patient, exerted little influence in modifying the consistence of the heart in the cases here considered; for of eleven hearts examined during the six winter months, four were flabby and seven firm; and of twenty-two inspected during the summer six months, nine were flabby and thirteen firm.

So that it seems probable that, in the cases of typhoid fever, the flabby condition of the heart was due to two causes,—1st, a tendency imprinted on the muscular tissue by the disease when death occurred within 25 days from its outset; and, 2dly, the external temperature. While in the cases of typhus fever here considered, although the latter cause might have had some influence, the principal, and by far the most active cause, must have been the impression produced on the heart by the disease itself. These opinions are still further strengthened by the fact, that so many cases of typhus fever prove fatal from the intensity of the general affection, and not from the supervention of local lesions, and that at all stages, even the most advanced, of the disease (*i. e.*, excluding cases fatal after the 4th week). Now it is at the earlier periods of typhoid fever only that the state of the system at large produces death. Thus an explanation is afforded of the fact, that the duration of the disease had a marked influence in the production of the altered consistence of the heart in typhoid, and not in typhus, fever; the *difference* in the influence of the temperature in the two affections was probably more apparent than real, because the tendency to produce the flabby state of the heart in typhus fever was so great, that the influence of the weather could scarcely be observed.

Dusky-red Staining of the Lining Membrane of the Heart was observed in twelve cases. In eight of the twelve both sides of the heart were stained; but in four of the eight the right side was darker than the left, and in one only was the left side darker than the right; in three cases the staining was confined to the right side. There was no discolouration of the endocardium in twelve cases; no note was made in eleven cases; so that about one-third, or eleven out of thirty-six, had the lining membrane of the heart discoloured; or if we except from the calculation those of which no note on the point was made, one-half would be thus affected, while, as I have shown, of the cases of typhoid fever one-sixth only, or rather two-thirteenths; or if I omit from the calculation the cases of which no note on the point was made, one-fourth only had the endocardium discoloured. It will be observed by the reader, that whichever calculation be used, the relative proportion is the same, and therefore, for the purpose for which these cases are here analyzed, it is a matter of indifference which of the two be adopted.

In every case, save one, the substance of the heart was flabby at the same time that its lining membrane was stained. The subject which formed the exception—a man, æt. forty, who died about 28 days after the commencement of the disease—was examined in the month of November, 22 hours after death.

In every case, excepting two, in which the endocardium was noted to be unstained, the substance of the heart was firm; these two cases were examined respectively 42 and 48 hours after death.

If the staining be viewed with reference to the date after death at which the cases were examined, the average number of hours which had elapsed from the hour of death till the subject was placed on the dead-house table, was, for the unstained, 24·7 hours—for the stained, 32·7 hours; two-thirds of the latter group were examined more than 30 hours after death; one-sixth only of the former more than 30 hours after the patients expired. So that the staining of the endocardium, and the flabby condition of the heart, depended apparently on the same causes.

Conditions of the Blood.—It was fluid in four cases; fluid, but mixed with a few loose black clots, in four others; these eight cases proved fatal on the 14th, 13th, 17th, 20th, 16th, 13th, 15th, and 17th days of the disease; and were examined respectively 16, 27 $\frac{1}{4}$, 21 $\frac{1}{2}$, 27, 22, 24, 45 $\frac{1}{2}$, and 20 hours after death.

The blood was fluid in the left side only of the heart in six cases; in two of these six there was a small dark coagulum; in two a large, loose, soft, black, and small fibrinous clot; in the fifth, a large, very loose, black clot, and much fluid blood; and in the sixth, a large, soft, pale yellow and black clot in the right side of the heart.

In one other case, there was a small black clot in the right side of the heart, while the left was empty.

In two cases there was a large, loose, black clot in the right side; in one of these two the left side of the organ was empty, and in the other contained a small black clot.

A small fibrinous clot only was found in two instances on the right side of the heart, and in both these there was a small black coagulum found on the left.

A large fibrinous clot, with much fluid blood, occupied the right cavities of the heart in four cases, and in these four the blood was found in a similar condition on the left side, but in smaller quantity.

In three cases a large, loose, fibrinous clot, and much dark fluid blood, filled the right auricle and ventricle, and a small fibrous clot lay in the left side.

In seven cases a large, loose, fibrinous, and black clot filled the right auricle and ventricle; in one of the two the left side of the heart was empty; in five it contained a small black, or black and fibrinous, coagulum.

In the remaining four of the cases of typhus fever in which the

condition of the blood after death was noted, a firm, yellow, fibrinous and black coagulum filled both the right and left sides of the heart; two of these four cases proved fatal at an uncertain period, but before the 21st day of the disease; the other two respectively on the 16th and 17th day of the disease. The age of these patients was between 32 and 45 years. The two cases in which the coagulum was the densest and largest, were complicated with extensive lobar pneumonia, and one of the two with erysipelas.

The blood was fluid, or nearly so, in the aorta and pulmonary artery in nine cases, and in all these nine cases it was also fluid in the venæ cavae and pulmonary veins; it was fluid in the veins in three other cases, in which its condition in the arteries was not noted.

In thirteen cases there was a clot of some size, fibrinous and black, in the pulmonary artery and aorta; in three of these thirteen cases it was fluid in the pulmonary veins and venæ cavae; and in four others of the thirteen the latter contained loose black coagula.

In the same subjects the clot was firm and the heart flabby in three cases. The clot was firm, and the substance of the heart firm, in six cases.

The clot loose and the heart flabby in five cases; the clot loose, and the substance of the heart firm, in nine cases.

So that in these twenty-three cases there was no constant relation between the condition of the blood and that of the heart.

The fluid condition of the blood generally, was observed in about equal proportion in the subjects dead from typhoid and typhus fevers, but with those exceptions there was a marked difference in the blood in the two diseases; it was far more profoundly diseased, *i. e.*, it deviated far more from its healthy condition, in the cases of typhus, than in those of typhoid fever.

LUNGS.

Typhoid Fever.—Eight cases either survived the thirty-fifth day of illness, or I was not permitted to examine their chests.

The lungs in one of the remaining fifteen cases were healthy in all particulars; this case proved fatal on the 25th day of disease, from hemorrhage from the intestines; there had been little or no heat of skin during life, and the pulse never exceeded 90; the general symptoms had been trifling. In another case there was only some mottled congestion of both lungs. Of this case I speak with hesitation—in truth, I think it ought probably to be arranged under the head of non-granular lobular consolidation, a condition with which, at the time I made the examination, I was but imperfectly acquainted, and which, consequently, I might have described by the term mottled congestion. In a third case, the only deviation from health was a considerable quantity of almost colourless frothy serosity in the apex of the right lung.

In all of the remaining twelve cases, there was more or less extensive consolidation of the pulmonary tissue.

These twelve cases may be thus grouped :—

1st, Five cases of non-granular lobular consolidation, distinctly circumscribed by interlobular septa. In one of the five, this condition was conjoined with granular lobar consolidation. In four of the five cases consolidated patches existed in both lungs. In neither of them, however, were both lungs equally affected. In the fifth case the left lung only was diseased.

2d, One case of non-granular consolidation, in separate patches, not bounded by interlobular septa; in this case portions of the pulmonary tissue, cut from the substance of the lung adjacent to the consolidated portions, sunk in water, if slightly pressed before immersion. Both lungs were nearly equally affected.

3d, Two cases of granular consolidation, in well-defined patches; whether these solidified portions were bounded by interlobular septa or not, was only imperfectly made out. In one of these cases the disease was limited to the left lung; in the other both lungs were affected; in the right, however, there was extensive lobar granular consolidation; in the left, lobular and lobar solidification.

4th, Two cases of granular consolidation, in distinct but not well-defined patches. In one of these two cases, the disease was double; in the other the right lung was affected with lobular, the left with lobar, consolidation.

5th, Two cases in which a state intermediate between the non-granular and the granular consolidation was exhibited. In one of the two the disease was double; in the other, limited to the left lung.

Physical Characters of Lobular Non-granular Consolidation.—Externally, a portion of lung in this condition has a mottled aspect, here and there are patches, varying in size from a single lobule to half or more of a lobe, of a deep bluish, chocolate, violet, or purplish slate colour, bounded by a well-defined angular margin, crossed, if it includes more than one or two lobules,—and mapped out into smaller patches, by dull opaque whitish lines. On closer inspection, the outline, and the whitish lines intersecting the patches, are seen to be thickened interlobular septa. Scattered in the midst of the larger patches, are frequently found one or more comparatively healthy lobules, of a pale brightish pink colour, contrasting strongly with the hue of the surrounding tissue. Here and there, near the border of the large patches, may be seen, occasionally, lobules, the centres of which have assumed the dusky purplish tint; the circumference of the same lobules yet retaining their healthy colour. The dark patches feel solid and flabby; the pulmonary tissue, at these spots, has lost the resiliency of health. The pleura covering the lung either retains its natural appearance, or has a slightly milky aspect.

On section, the tissue corresponding to the dark patches, is found to be of a deep purplish chocolate colour, gorged with non-aerated bloody-looking fluid, breaks down with little or no increased facility, nay, sometimes appears tougher, than in health; has a uniform or nearly uniform section, *i.e.*, there is no appearance of granules, such

as are seen in the consolidated state of so-called vesicular pneumonia ; sinks in water, like the patches seen externally ; is bounded by interlobular septa ; but these divisions, between the consolidated and non-consolidated tissues are less marked, especially the most superficial tier, so to speak, of lobules.¹

A minute portion can be cut from the middle of a lobule—the centre of which is dusky purple, and the circumference brightish pink—which sinks in water ; equally small pieces of pulmonary tissue, taken from the circumference of the same lobule, float.

The following account of the superior lobe of the right lung of a girl, æt. 15, who died on the twelfth day of disease, illustrates some points in the above description :—

Its posterior part had a mottled aspect; the darker portions being of a purplish slate and violet colour ; the lighter of a pinkish violet. The septa between the lobules was well marked, white and opaque. The mottling was found, on close inspection, to depend on the difference in colour of the lobules. Some were dark throughout ; the dark colour terminating abruptly at the interlobular septa. At places several of these dark lobules were in contact, forming a deep-coloured patch, crossed by the white septa. Some of the lobules, here and there, were pale, but the centres of some of those which were generally pale, were dark ; the size of this dusky central spot varied in different lobules, as if the non-granular consolidation had commenced in the centre, and then spread till it involved the whole lobule. The pulmonary pleura had a slightly milky aspect. On section, the distinction between the lobules was well marked, and the difference in their colour almost as much so as on the surface. The paler lobules were crepitant, floated in water, and possessed their normal consistence. Some of the darker contained a little air, others none ; they sank in water, and broke down with facility under pressure. Parts of the middle and inferior lobes of the same lung were in a state of red, and parts of grey hepatization. The superior lobe of the opposite lung was natural in colour and consistence. The inferior lobe, natural in appearance anteriorly, was mottled *posteriorly* ; the darker parts being non-crepitant, the bright red crepitant. The bronchial tubes of both lungs contained much frothy mucus ;

¹ I have proved, by injecting the lung in this non-granular consolidated state, common to all acute diseases of determinate duration, dependent for their origin on a specific cause, and accompanied by febrile excitement, as measles, scarlet fever, small-pox, typhoid and typhus fevers, that occasionally the centre of the lobule is really the point at which the diseased action is first set up ; but then it is doubtful how far this, in the cases referred to, was dependent on an inflammatory condition of the bronchial tubes, extending downwards to their termination in the vesicular tissue of the lobules. The question can only be answered by an analysis of numerous cases, in which all the possible determining circumstances, *i.e.*, the co-existence of bronchial inflammation, &c. &c., are considered at full. There was no trace in these cases of the bronchial fibrinous plugs, described by some writers as invariably found in catarrhal pneumonia.

their living membrane was bright red ; its consistence and thickness were considered natural.

The following description of the lungs of a girl, æt. 16, offers an example of non-granular lobular consolidation, uncomplicated with the granular form. As in the last, the bronchial mucous membrane was the seat of increased vascularity ; but the bronchial symptoms, during life, had not been prominent. The left lung weighed 16 oz. ; was of a dark pinkish violet ; externally scarcely darker posteriorly than anteriorly. Over the whole surface were scattered various sized patches, of a deep purplish colour, from base to apex ; the majority distinctly bounded by interlobular septa. The number of lobules in each patch varied from one to eight or ten ; some of the darker lobules were situated near the anterior margin of the lung. On section, the darkest coloured patches, seen externally, were saturated with bloody fluid, non-crepitant, sank in water, and had a uniform or nearly uniform section. The somewhat less dark coloured patches contained much bloody fluid, but little air, yet floated in water. The whole lung, on section, was darker than natural, and the interlobular septa particularly distinct. It contained a considerable quantity of frothy serosity, but scarcely more posteriorly than anteriorly. The right lung in the same subject weighed $21\frac{3}{4}$ oz. ; was gorged with reddish frothy serosity ; felt rather more solid than natural, but every part floated in water. The bronchial mucous membrane in both lungs was intensely injected, of a dusky red colour ; the redness being in streaks, punctæ, and patches. The bronchial tubes were filled with thin frothy mucus. In the case in which the non-granular consolidated portions of lung were not circumscribed, but passed imperceptibly into the crepitant tissue, the posterior part of the lung only was affected ; and the still crepitant tissue was gorged with bloody serosity, and broke down with abnormal facility—both lungs were equally affected.

Granular Lobular Consolidation.—The physical appearances presented by the lobules thus affected, characteristic, as they are, of the second stage of pneumonia, are too well known to require description.

The following, offering an example of the well-defined lobular granular consolidation, was the condition of the superior lobe of the left lung of a man, æt. 28, who died on the 27th day of disease. In its substance were two or three masses, the size of filberts, firm to touch ; on section, of a deep red colour, friable, distinctly granular, readily breaking down under pressure ; the line of demarcation between the crepitant and consolidated tissue was well marked and defined. The inferior lobe of the same lung presented the following appearance :—A small portion overlapping the heart was pale and crepitant ; the most inferior and posterior portion of the same lobe felt solid ; contained no air ; was very friable ; had a granular fracture ; of a pale red colour ; sank in water ; and, on pressure, gave exit to an opaque bloody muco-purulent fluid. The in-

termidiate portion of this lobe was *non-granular*; of a deep purple colour; sank in water; contained no air; on pressure, gave exit to a bloody-looking fluid (very different in appearance from the pale, dirty, red muco-purulent fluid above described).

The transition from the one to the other of the three above described pathological conditions, was at some places gradual, at others abrupt and well defined. The right lung weighed 2 lb. 4 oz.; its inferior lobe resembling the corresponding part of the left lung, but a much larger portion, more than half, was in a state of granular consolidation.

Of the granular non-circumscribed form of lobular consolidation, the following account of the inferior lobe of the right lung of a man, æt. 23, who died on the 20th day of disease, presents an example. Near the base of the lobe were two or three masses of consolidated tissue, of a dark colour, which sank in water, and readily broke down under pressure. Their cut surface was granular; the tissue between tough and crepitant, as in its normal condition.

The following particulars of the lungs of a female, aged 32, who died on the 34th day of disease, exhibit a condition of the pulmonary tissue, which appears intermediate between the non-granular and the granular consolidation.

The right lung weighed $15\frac{1}{4}$ oz.; was crepitant throughout; felt more solid behind than before; was of a dirty red colour; and floated in water when cut in pieces. The left lung weighed $15\frac{1}{2}$ oz. (*i.e.* was comparatively heavy); its most depending portion (the subject being on its back) felt solid, contained little air, sank in water, broke down readily under pressure, but had not the appearance of solidified lung in the second stage of either the so-called vesicular or intervesicular pneumonia.

Lobar granular consolidation was, in three instances, conjoined with the foregoing conditions; *i.e.*, in one of the three cases with abruptly defined lobular granular consolidation; in one with granular consolidation, the outline of which was not abruptly defined; and in the third it was conjoined with circumscribed *non-granular* consolidation.

Typhus Fever.—Thirty-five cases are eligible for analysis. In two of these thirty-five the lungs were healthy in all particulars. In a third case, the posterior congestion was so slight, that it could scarcely be considered a deviation from health. The remaining thirty-two cases may be thus grouped.

1st, Three cases of simple congestion of the posterior part of the lungs. In two of the three, both lungs were equally affected; in one the left lung was more congested than the right.

2d, Three cases of congestion of the posterior part of the lungs, with diminished consistence of the congested parts. In one of the three, both lungs were equally affected; in another, the right was more deeply diseased than the left; in the third, the left lung only was

in this condition, the posterior part of the right being simply congested.

3d, Eleven cases of congestion of the posterior part of the lung, with non-granular consolidation of the most depending (the subject being on its back) layer of pulmonary tissue. Both lungs were affected in five of the ten cases; but, in two of the five, one lung was more extensively solidified than the opposite. In six cases one lung only was thus diseased. In one case only was there any attempt at circumscription.

4th, In four cases, the most obvious departure from a normal condition, was a great excess of almost colourless serosity in some portion of the pulmonary tissue. In one of the four there was marked congestion, with diminished consistence of the most depending part of both lungs, the right being more affected than the left; the most congested portions contained the greatest amount of serosity. In a second, there was simple congestion of the most depending part of the lungs, with great excess of serosity in the superior lobes. In another case, in which there was moderate congestion of the most depending part of the left lung, there was little serosity in the inferior lobe, while the upper half of the superior lobe, anterior as well as posterior part, was saturated with frothy serosity. The right lung, in the same subject, was more congested posteriorly; in the same part of both lobes the excess of serosity was great; but the apex contained more than the other parts. While, in the fourth case, the excess of serosity was limited to the apex of the right lung, from which it flowed, as if from a sponge saturated with moisture. There was no congestion of the vessels of the superior lobe in this case.

5th, In eight cases there was lobular consolidation. In two of the eight, the consolidation was non-granular and abruptly defined. In one of the two it was limited to the left lung; in the other it affected both lungs. In two there was a similar form of solidification; but the line of demarcation between the crepitant and non-crepitant tissues was only marked at places,—in one the right, in the other the left lung, only was affected. In two of the eight, granular and non-granular consolidation of the pulmonary tissue was present in the same subject. There was no distinct line separating the solidified from the crepitant tissue in these two cases,—in one of them, both lungs were nearly equally affected. The solidified masses in this case appeared to be in a state intermediate between the granular and non-granular consolidation; in the other, granular lobar solidification was present in both lungs. In the remaining two of the eight cases of lobular consolidation, the diseased lobules were granular; in one central, occupying the left lung only; in the other confined to the left lung, while the right, in the same subject, was affected with lobar granular consolidation.

6th, Lobar granular consolidation of the upper portion of the inferior lobe of either lung, existed, uncomplicated with the lobular form, in one case.

In one of the last referred to cases, there was commencing gangrene of the pulmonary tissue; and, in another case, not included in the thirty-five, there was well-marked circumscribed gangrene. The latter occurred in a boy *aet.* 8 years, who died on 22d day of disease. In this same boy a portion of the cornea of both eyes sloughed out before death. The right lung presented the following appearance: It was closely collapsed; in the pleura were about 3 oz. of purulent fluid, possessing a highly-offensive odour. From the centre of the closely collapsed superior lobe projected a mass, which felt about the size of a pigeon's egg, one half of which, however, was buried in the pulmonary substance. The smoothness of the projecting mass contrasted strongly with the corrugated appearance of the general external surface of the superior lobe. On cutting through this mass, its centre was found to be occupied by black semi-fluid matter of very offensive odour; stretching across this black pulpy mass were delicate bands of some consistence. This gangrenous mass was about an inch in diameter, and was distinctly bounded by a border of *white* soft pulpy matter, about half a line in thickness. The pulmonary substance surrounding this white line, for some lines in every direction was softened, of a purplish red colour, contained no air, had a smooth and uniform non-granular section. Externally, this condition of the pulmonary tissue extended to the pleura. From the inferior lobe of the same lung a prominence, similar to that described above, projected. On cutting into it, some offensive gas escaped, and the anterior wall collapsed. The cavity, laid open by the section, contained some dark semi-fluid black matter and gangrenous shreds,—the whole circumscribed by a white line, similar to that described, as bounding the gangrenous mass in the upper lobe. The external wall of the cavity was *very* thin, and on the pleural surface was a black spot about the size of a split pea, with well defined outline. In the vicinity of the above were two smaller masses, closely resembling the last described.

It is unnecessary to repeat the descriptions of granular and non-granular lobular consolidation; but, as congestion of the posterior portion of the lung, with non-granular consolidation of the most depending part of the organ, did not present itself among the cases of typhoid fever, it is necessary to describe the appearances exhibited by lungs in that condition. The posterior portion of the lung, in the cases included under this head, was congested, and its consistence diminished; the most depending layer of pulmonary tissue (the subject being on its back), which extended, in different cases from a quarter of an inch to two inches into the substance of the lung, was solidified, very dark bluish chocolate in colour, gorged with non-aerated dark claret serosity, which flowed freely from the cut surface; it was scarcely softened; the whole of the solidified layer sank in water. The consolidation did not, unless it extended far into the pulmonary substance, affect the extreme base, the apex of the inferior lobe, nor the root of the lung, *i.e.*, that portion which is imme-

dately in contact with the vertebral column, but was limited to the part of the organ which lies in the hollow formed by about the 4th, 5th, and 6th ribs, as they curve backwards, outwards, and forwards, from the bodies of the dorsal vertebræ. The solidified and crepitant tissue passed, imperceptibly, the one into the other. The transition from the pale anterior portion of the lung to the congested posterior, and from that to the most depending solidified tissue, was in the greater number of cases gradual, and not abrupt, as in the circumscribed non-granular lobular consolidation. As was stated (p. 19), only one lung, in six of the cases grouped under this head, was affected; therefore, although position was the determining cause, some other agent was concerned in the production of this morbid condition—a condition by no means peculiar to fever.

In order to exhibit the difference observed in the lungs of the subjects dead from typhoid and typhus fever, it will be necessary to sum up the particulars detailed in the preceding analysis.

In thirty-four cases of typhus fever, there were four examples of granular consolidation, *i. e.*, nearly one-ninth of the whole.

In fifteen cases of typhoid fever, there were four cases of granular consolidation, *i. e.*, about one-fourth.

Three cases of lobular non-granular congestion in the thirty-four cases of typhus fever, *i. e.*, about one-twelfth, while six, or three-fifths, of the cases of typhoid fever, exhibited the same lesion.

Congestion with consolidation, evidently determined by position, was present in nearly one-third of the cases of typhus fever, and in no single instance of typhoid fever.

The comparative frequency of the granular and of lobular non-granular consolidation in the cases of typhoid fever, is too marked to be the result of accident. It is evidently a feature impressed on the pulmonary organs by the disease itself, as will be more evident on examining the conditions of the pleura in the two diseases.

It is also worthy of remark, that in no case of typhoid fever was gangrene of the lung present, while it occurred in two cases of typhus. The occurrence of six cases of congestion of the posterior portion of the lung, with or without diminished consistence, is also a distinctive feature; for, be it remembered, the one class of patients had been confined to bed as long as the other,—nay, the cases of typhoid fever proved fatal at a later period of disease.

BRONCHIAL TUBES.

Typhoid Fever.—Notes respecting the condition of the bronchial tubes, were made only in twelve of the cases included among those here analyzed.

In four of the twelve the lining membrane was pale in colour; in the remaining two-thirds it was vividly injected, or *bright* red.

Typhus Fever.—The condition of the bronchial tubes was noted in twenty-two cases.

In two cases they were pale in colour; in two slightly congested;

in eighteen they were noted to be more or less deeply congested, or *dusky* red.

PLEURÆ.

Typhoid Fever.—Of those cases which proved fatal before the 35th day of disease, the chest was examined in fifteen.

There were present unequivocal signs of recent inflammation of the pleura in six cases, *i. e.*, in the proportion of 40 per cent. These signs were recent adhesions, or the effusion of lymph.

Typhus Fever.—Thirty-six cases are eligible for analysis. In three of these cases there were signs of recent inflammation of the pleura; but in one of the three the lesion consisted in the presence of pus in the cavity of the pleura, secondary to gangrene of the lung. In two cases only was there any recent lymph, and in one of these it was merely sufficient to render the serosity turbid, and in the other to cause trifling adhesions. Thus, if these three cases be considered as cases of recent inflammation, pleuritis only occurred in the proportion of 8·3 per cent.; while, if the two latter only are considered, but in the proportion of 5·5 per cent. It has been just shown, that 40 per cent. of the subjects dead from typhoid fever exhibited unequivocal signs of recent inflammation of the pleura.

For the purpose of clearly estimating the value of the differences in the symptoms and lesions of structure analysed in the preceding papers, it will be necessary here briefly to recapitulate those differences.

Age.—Typhoid fever was limited, in the cases here considered, to persons under 40 years of age; nearly one-third of the forty-three cases of typhus were more than 50 years of age.

Mode of Attack.—As a general rule, the attack of typhoid fever commenced more insidiously than that of typhus fever. This observation, like all others in this paper, applies, of course, only to fatal cases.

Duration.—The average duration of the fatal cases of typhoid fever was 22 days. Of the fatal cases of typhus fever, 14 days. Half the cases of typhoid fever survived the 20th day of disease. Not a single case of typhus fever survived the 20th day of disease.

Eruption.—The difference in the appearance of the eruption in the two diseases was as great as it well could be, considering that both were of a reddish hue.

Miliary Vesicles, or Sudamina.—These vesicles were present in an equal proportion of the cases of both diseases under 40 years of age. But in no cases of typhus fever, more than 40 years of age, were they detected.

Subsequent experience leads me to believe that miliary vesicles are rarely seen on individuals more than 40 years of age; and very rarely indeed, if ever, on patients more than 50 years old. I have during the last year—*i. e.*, since my attention was directed to this point—seen these bodies on no one of the many patients more

than 50 years of age, labouring under various diseases, that have come under my observation.

Expression, Manner, Hue of Face, &c.—As the rule, in the cases of typhoid fever here analysed, the expression was much less indicative of prostration, and more anxious, than in the cases of typhus fever. In the former disease, the complexion was tolerably clear, and the flush, when present, was of brightish pink colour, limited to one or both cheeks, and often distinctly circumscribed. In typhus fever, on the contrary, the complexion was thick and muddy, the flush of the face uniform, and of a dusky red colour.

Headache was a constant symptom in all the cases of typhoid and typhus fevers; but it disappeared by about the 10th or 12th day in the latter, and not till the termination of the second, or middle of the third week, in the former.

Delirium commenced in three only of ten cases of typhoid fever before the 14th day; while it began in fourteen out of fifteen cases of typhus fever before the 14th day. As a rule, the delirium was decidedly more active in typhoid than in typhus fever.

Somnolence.—In eight out of nine cases of typhoid fever, somnolence commenced after the 14th day of disease. In seventeen out of eighteen cases of typhus, before the termination of the second week.

Coma-Vigil.—One-fifth of the cases of typhus fever experienced coma-vigil; not a single case of typhoid fever experienced that condition.

Spasmodic Movements were nearly equally frequent in the two diseases.

Retention of Urine, and Involuntary Discharge of Urine and Stools, occurred with equal frequency in the two diseases; but at a much earlier date in typhus than in typhoid fever.

Loss of Muscular Power.—Little more than a fourth of the patients attacked with typhoid fever kept their bed entirely before the 7th day of disease. All the patients affected with typhus, whose cases are here considered, took altogether to their beds before the 7th day of disease.

The prostration was rarely so extreme in the cases of typhoid fever as in those of typhus fever. Extreme prostration, when it did occur in typhoid fever, was not observed till from the 14th to the 30th day, while in a large majority of the cases of typhus fever it was marked between the 9th and 12th day of disease.

Epistaxis was present in five of fifteen cases of typhoid fever—in not one of twenty-three cases of typhus fever.

Hearing was equally and similarly affected in the two diseases.

Eyes.—The conjunctivæ were *very much* more constantly and intensely injected in the cases of typhus than in those of typhoid fever; the pupils were absolutely larger than natural in a majority of the cases of the latter disease, while they were abnormally contracted in a large majority of the cases of the former affection.

Tongue.—Although individual cases of the two diseases may have

elosely resembled each other in the appearance of the tongue, yet, taking the whole of either group of cases, this organ presented a singularly different aspect in the one from what it did in the other. It was much more frequently moist throughout the disease in typhoid than in typhus fever. When dry, it was often red, glazed, and fissured, in the former; rarely so in the latter. Again, in typhoid fever, when the tongue was brown, its hue was much less deep—it was of a yellowish, instead of a blackish, brown. The small dry tongue, with red tip and edges, smooth, pale brownish-yellow fur, fissured—the surface seen between the fissures being deep red—may be considered differentially as a diagnostic sign of typhoid fever. One only of twenty patients affected with typhoid fever, but eight of forty patients labouring under typhus fever, were unable to protrude the tongue when bidden.¹

Intestinal Haemorrhage occurred in one-third of the patients affected with typhoid fever—in none of those suffering from typhus fever.²

The other abdominal symptoms and signs need no recapitulation.

Appetite and Thirst.—No difference in the two diseases.

Pulse.—The frequency of the pulse fluctuated much more, from day to day, in the cases of typhoid than in those of typhus fever.

Cough and Physical Chest Signs.—Sonorous râle was very much more frequently present in the cases of typhoid than in those of typhus fever—*i. e.*, it was present in eleven out of twelve cases of the former, and in seven only of twenty-one cases of the latter. Dulness of the most depending part of the chest, from intense congestion of the lung, was observed in nine cases of typhus fever—in no case of typhoid fever.

Sloughing appeared to be nearly equally frequent in the two diseases.

Erysipelas occurred in seven of the twenty-three—*i. e.*, in nearly a third of the cases of typhoid fever; in two only of the forty-three cases of typhus fever—*i. e.*, in less than one-twentieth of them.

Cadaveric Rigidity ceased much more quickly in the subjects dead from typhus fever than from typhoid fever.

Discoloration of the Walls of the Abdomen, and of the Skin covering the larger Veins, was much more frequently present in those dead from typhus than typhoid fever.

Emaciation had made greater progress in the typhoid than in the typhus subjects.

Spots.—The spots observed during the progress of the cases of

¹ This clearly indicates the difference in the amount of prostration in the two diseases.

² I may remark that, in one case only of typhus fever, received into the London Fever Hospital during the last three years, has blood passed from the bowels. The case referred to was that of an old man, who had haemorrhoids, which occasionally bled when he was in health. During the time specified, notes of near 2000 cases have been taken.

typhus fever continued after death ; no trace of the spots visible during life could be detected after death from typhoid fever.

Head.—After typhoid fever, the pia mater and arachnoid separated from the convolutions with abnormal facility in one only of nine cases examined with reference to the point. The vessels of the pia mater were abnormally filled with blood in one-third of the cases, but intensely congested in one only of fifteen cases ; the cerebral substance was congested in one-seventh of the cases. After typhus fever, the pia mater and arachnoid separated with abnormal facility in nine of eleven cases of which notes on the point were made. The vessels of the pia mater were congested in nearly half, and intensely congested in one-fifth, of the whole of the cases ; while the cerebral substance itself was abnormally congested in half.

Hemorrhage into the Cavity of the Arachnoid, which was not found in a single case of typhoid fever, had occurred before death in one-eighth of the cases of typhus fever.

The amount of serosity found within the cranial cavity was decidedly greater after typhus than typhoid fever.

Pharynx.—After typhoid fever, this organ was found ulcerated in one-third of the cases. After typhus fever, ulceration of the pharynx was not detected in a single case.

Larynx.—Ulceration of the larynx was found in one of fifteen subjects dead from typhoid fever—in one of twenty-six from typhus fever.

Oesophagus.—After typhoid fever, ulcerated in one of fifteen cases in which it was examined. After typhus fever, the oesophagus was free from ulceration in all the twenty-four cases in which it was examined.

The epithelium separated from the oesophagus spontaneously at an earlier period after death from the latter than the former disease.

Stomach.—In none of the fifteen cases examined after death from typhoid fever was the mucous membrane of the stomach softened throughout its whole extent ; in no case did softening of the cardiac extremity approach perforation. In four of thirty-seven cases of typhus fever the whole mucous membrane of the stomach was softened ; and in four others there was such extreme softening of the whole of the coats of the great *cul-de-sac*, that they were perforated by the slightest violence.

Small Intestines and Mesenteric Glands.—The presence or absence of lesion of these organs was the ground on which the cases of typhoid and typhus fever here analysed were divided from each other,—consequently they were invariably diseased in the one and normal in the other.

Large Intestines.—After death from typhoid fever, the mucous membrane of the large intestines was found ulcerated in rather more than a third of twenty cases. In no instance after death from typhus fever.

Peritoneum.—As peritonitis was in typhoid fever secondary to, and

dependent on, the entero-mesenteric disease, it may here be excluded from consideration.

Spleen.—This organ was enlarged in all the cases of typhoid fever—softened in one-third of the cases only. Before the age of 50, it was as large after typhus as typhoid fever; after that age, it was decidedly smaller in the former than in the latter affection. After the age of 50, it was as soft in typhus as in typhoid fever; before that age, it was less frequently softened.

Gall-Bladder.—There was ulceration of the lining membrane of the gall-bladder in one of fourteen cases of typhoid fever; in none of thirty-one cases of typhus fever. In the latter disease the bile was much thicker, and of a darker green colour, than in the former.¹

Liver, Pancreas, Kidneys.—These organs were more flabby in the cases of typhus than in those of typhoid fever.

Urinary Bladder.—This viscus was ulcerated in one of the cases of typhoid fever—in none of the cases of typhus fever.

Pericardium.—This cavity contained a small amount of yellowish transparent serosity in all the cases of typhoid fever examined. The contained serosity was red, from transudation of a solution of haematoxin, in five of thirty-one cases of typhus fever, in which the pericardium was examined before the termination of the fever.

Heart.—The muscular tissue of this organ was much more frequently and decidedly flabby, and its lining membrane was much more frequently and deeply stained of a dark red colour, in the cases of typhus fever than in those of typhoid fever.

Lungs.—Granular and non-granular lobular consolidation were very frequent in the subjects dead from typhoid fever—rare in those dead from typhus fever. The reverse was the fact with reference to consolidation from congestion of the most depending part of the lung.

Pleura.—Recent lymph or turbid serosity was found in six of fifteen cases of typhoid fever—*i. e.*, between half and one-third, or in the proportion of 40 per cent. The same lesions, but much less in amount, were found in two only of thirty-six cases of typhus fever—*i. e.*, one-sixteenth, or in the proportion of 5·5 per cent.

The particulars here briefly recapitulated, and still more those fully detailed in the foregoing papers, appear to me to prove indisputably that the symptoms, course, duration, anatomico-pathological lesions, and the tendency to cadaveric changes, are different in typhoid fever to what they are in typhus fever.

To account for the differences in symptoms which exist in continued fever, with and without entero-mesenteric disease, the two following assertions have been put forward:—

1st. That typhoid fever is merely typhus fever complicated with lesion of a particular organ; and therefore it is to be expected that

¹ The condition of the bile, as found after death in these two diseases, is worthy of more careful investigation. The difference in appearance is, in a large majority of cases, well marked.

certain symptoms referable to, and dependent on, that lesion will be present, and so far modify the symptoms of the disease. If the symptoms and signs referable to the intestinal disease as a cause—*i. e.*, the condition of the tongue, the diarrhoea, increased resonance, and fulness of the abdomen, gurgling in the iliac fossa, pain and tenderness in the same region, or even the daily fluctuations in frequency of the pulse—were the only symptoms by which typhoid fever was separated from typhus fever, although the idea might cross the mind that they were two diseases, no sufficient ground for their separation would be present, unless the specific cause of the one was proved to be different from that of the other. But, putting aside the symptoms strictly referable to the abdominal lesion, the general symptoms of the two diseases, in the cases here analysed, differed widely; such differences having no apparent connection with the local affection, but being probably, like it, dependent on some common cause acting on the whole system simultaneously.

Thus the remarkable differences in the kind, not simply amount,¹ of the rash in the two diseases; and the tendency to local inflammations, to erysipelas, and to ulceration, observed in the cases of typhoid fever here analysed, cannot, with any show of reason, be considered to have been dependent on the disease of Peyer's patches—*i. e.*, in the same way as the abdominal signs undoubtedly were; and it is to be carefully borne in mind that the external, the hygienic, conditions of either group of cases, were precisely the same in all respects. They occupied the same wards, partook of the same diet, slept on the same beds, under the same amount of clothing, and had the same physicians to attend them, and the same nurses to wait on them.

Moreover, of the symptoms common to the two, the headache continued longer, and the delirium and somnolence came on, as we have seen, much later, in typhoid than in typhus fever; and the delirium, too, possessed a more active character. These differences, also, cannot be explained by the presence of intestinal disease in the former, and its absence in the latter affection.

The short comparative duration of the cases of typhus fever, here considered, is another remarkable point of difference, totally inexplicable by the hypothesis, that typhoid fever is typhus fever with intestinal ulceration. Had the cases eventually recovered, it might have been said, that the intestinal lesion prolonged the disease in the cases of typhoid fever; but that all the fatal cases of fever, with a local lesion of so severe a nature as that recorded to have been present in the cases of typhoid fever, should have had a much longer course than all those other fatal cases of fever in which no organic change of struc-

¹ I have elsewhere shown that the rash and the intestinal disease cannot be considered supplementary of each other. See *Medical Times*, December 1849, and January 1850.

ture could be detected after death, appears to me inexplicable, on the supposition that the former is simply the latter disease, with this serious lesion superadded. Let me repeat, by this hypothesis we are asked to imagine that death is retarded in fever by extensive ulceration of the small intestines, and enlargement, softening, and even suppuration of the mesenteric glands. Surely it behoves the supporters of such a statement to bring forward cogent proofs of the identity of the specific cause of the two affections ere they ask us to admit its truth.

The same mode of reasoning appears to me equally conclusive, when we consider the comparatively early period of the disease at which the patients, suffering from fever, lost the ability to make muscular exertion. For to suppose that the presence of abdominal complication in fever invariably prevented the extremely early supervention of debility, is, *a priori*, still more absurd than to suppose such lesions to have retarded death. How, again, are we to explain, if we regard typhoid as typhus with abdominal complication, the differences observed in the ages of the patients, in their general manner; the muddy hue of the skin, and uniform flush of the face, the injected conjunctivæ, and contracted pupils in typhus fever; and the comparatively clear complexion, the pink flush limited to the cheeks, the pale conjunctivæ and the large pupils, in typhoid fever?

In what way, also, are we to account for the differences observed in the physical breath signs, on the supposition that the one is merely the other, with abdominal complication?

Death itself, moreover, adds new proof to the non-identity of the general affection in the two diseases. The comparatively rapid loss of muscular rigidity, the discoloration of the surface, the more flabby condition of the heart, liver, and kidneys, the extreme softening of the stomach, and the early separation of the epithelium, after typhus fever, are all cadaveric changes, by which death makes us cognizant of a condition of the system at large, which condition must have existed anterior to the cessation of life from that disease; and which condition could not have been present in the cases of typhoid fever, or death would have made it manifest.

I need not here more than advert to the difference observed in the lesions which death simply enabled us to lay bare. The almost constantly congested brain and membranes in typhus fever; the frequent presence of the signs of pre-existing serous inflammation in typhoid fever; the difference in the nature of the pulmonary lesions in the two—are inexplicable on the supposition that the one disease is the same as the other, excepting so far as concerns the abdominal affection.

Thus tried by facts—*e. i.*, by recorded symptoms and lesions,—the assertion that typhoid fever is merely typhus fever with abdominal complication, is completely refuted.

2d. But another mode of explaining the differences which exist between the two diseases has been given—*i. e.*, that the differences ob-

served depend on variations in the epidemic constitution. These cases afford a complete answer to this assertion. For a majority of the cases here analysed of both diseases were observed during the same epidemic constitution. If the reader will refer to p. 6, he will find that nineteen of the cases of typhus fever I have used in this analysis were collected between May and November 1848; and that thirteen of the cases of typhoid fever were collected during the same months of the same year. For such as prefer broad general assertions to the details of particular but more limited facts, I may remark, that during three years' attentive watching of nearly all the cases admitted into the London Fever Hospital, in which time there have been epidemics of relapsing fever, typhus fever, and cholera—and, consequently, according to those whose opinions I am here examining, as many changes in epidemic constitution—I have seen no alteration in the general or particular symptoms of either typhus or typhoid fevers, or the lesions observed after death from either—*i. e.*, from November 1846, to November 1849. The cases of typhoid fever—which disease is rarely absent for a fortnight from the wards of the hospital,—preserved their symptoms unchanged, and presented the same lesions, whatever the epidemic constitution that prevailed; the same is true of typhus fever. Cases of the latter disease are also rarely absent from the wards of the same institution. It is there common to see patients occupying beds side by side, and presenting respectively the well-marked characters of either disease.

But to return to the particular cases here analysed. Allowing to epidemic constitution all the power of modifying disease claimed for it by certain writers, it must be granted that whatever influence this epidemic constitution exercised over the group of cases without intestinal lesion, it ought to have exercised over the group of cases with intestinal lesion, because the cases of the two groups were scattered indiscriminately over the space of two years only. If, I repeat, the two affections were really the same disease, then the same epidemic constitution ought to have impressed on both the same general features, implanted in both the same local lesions, and given to both the same tendency to eadaverie change, and this allowing for all the modifying influence which the accidental presence of the abdominal lesion in the one and its absence from the other group might have occasioned. The analysis of every symptom and every lesion shows that the two affections were not thus assimilated by the prevalence of any particular epidemic constitution. But if this epidemic constitution, by any stretch of the imagination, could be supposed to change from week to week, to cause the case attacked to-day to have typhus fever, the individual who takes the disease to-morrow to have typhoid fever, still, it could not account for the fact,—as well established as any fact in medicine,—that typhoid fever rarely, if ever, affects persons more than fifty years of age; while age exerts little influence in determining the occurrence of typhus fever.

Thus, then, the assertion that typhoid fever is merely typhus fever modified by the prevailing epidemic constitution, is as irreconcilable with facts, as that the former disease is simply the latter with abdominal complication.

To conclude,—At the commencement of this analysis I proposed to examine whether typhoid fever and typhus fever differed from each other in the same way as small-pox and scarlet fever differed from each other; and, for the purpose of comparison, I laid down certain grounds, as those on which we founded our belief in the non-identity of the two last-named diseases. Those grounds were:—

1st, In the vast majority of cases the general symptoms differ—*i. e.*, of small-pox and scarlet fever.

[This holds equally true with respect to the general symptoms of typhoid and typhus fevers.]

2d, The eruptions, the diagnostic characters, *if present*, are never identical—*i.e.*, in small-pox and scarlet.

[The particulars detailed in the foregoing papers prove that this is as true of the eruptions of typhoid and typhus fever, as of those of small-pox and scarlet fever.]

3d, The anatomical character of small-pox is never seen in scarlet fever.

[Just in the same way the anatomical character of typhoid fever—*i. e.*, lesion of Peyer's patches and the mesenteric glands—is never seen in typhus fever.]

4th, Both—*i. e.*, small-pox and scarlet fever—being contagious diseases, the one by no combination of individual peculiarities, atmospheric variations, epidemic constitutions, or hygienic conditions, can give rise to the other.

[I have here not attempted to determine how far this holds true with respect to typhoid and typhus fevers; but I have considered it in a paper read before the Medico-Chirurgical Society of London, December 1849, the contents of which I may anticipate so far as to state, that to my mind the origin of the two diseases from distinct specific causes, is as clearly proved as that scarlet fever and small-pox arise from distinct specific causes.]

5th, The epidemic constitution, favourable to the origin, spread, or peculiarity in form or severity of either—*i. e.*, small-pox and scarlet fever—has no influence over the other, excepting that which it exerts over disease in general.

[The facts detailed in these papers prove that this holds as true of typhoid and typhus fevers as of small-pox and scarlet fever.]

If, then, the above are the grounds—and, after mature deliberation, I am able to assign no others—for the separation of small-pox from scarlet fever, I think it is indisputably proved, that typhoid fever and typhus fever are equally distinct diseases;—not mere varieties of each other, but specifically distinct,—specific distinction being shown in typhoid and typhus fevers, as in small-pox and scarlet fever, by the difference of their symptoms, course, duration, lesions, and *cause*.

Before concluding, I ought to observe, that, with respect to some secondary points—*e. g.*, the chronological relation between the laryngeal and pharyngeal affections—it may be considered that I have drawn general conclusions from a too limited number of facts. But a few facts, impartially observed, minutely recorded, and carefully analysed, are, I believe, more likely to give correct results than a multitude of general observations; and, moreover, I believe most men would be astonished if they had in numbers all the cases of any given disease they had ever seen, yet concerning which they have generalized. The method I have adopted, however prolix it may be, however difficult to conform to, however tedious the details into which it leads, has this advantage, that if the observer be honest and capable of noting what is before him, thinking men may judge of the value of his facts, the force of his reasoning, and the correctness of his conclusion; whereas general observations, while they are totally incapable of proving anything, are exposed to all the fallacies of definite statements, because the one, like the other, rests ultimately on the accuracy of the facts observed. If the observations, on which any reasoning is founded, be erroneous, no cloaking of those observations in general terms, can render the conclusions correct. It has been objected to definite numerical statements, that they mislead the reader by an *appearance* of accuracy, in cases where there has been great inaccuracy in observation. This objection appears to me to lie against the condition of the reader's mind and not against the method. For if the reader fails to examine, 1st, the trustworthiness of the author, and 2dly, the legitimacy of his conclusions, the fault is, obviously, mentally his own, and in noways to be ascribed to the method. Because chemists have, by the imperfection of their analyses, arrived at incorrect conclusions as to the ultimate constitution of various organic bodies, we surely would not have them henceforth confine themselves to the general impressions produced on their minds by a series of experiments or observations. The more complicated the problem to be solved, the more careful ought we to be that *every* step in its solution is made correctly. How complex questions, such as arise in medicine, are to be determined mentally—*i. e.*, without the aid of figures—by ordinary men, I am at a loss to conceive. Yet physicians think to solve, by mental reveries, problems in comparison with which the most difficult that the most renowned mental calculators ever answered were child's play; and not only do they think to solve these problems, but to carry in their minds for years the complicated materials by which they are to be solved.

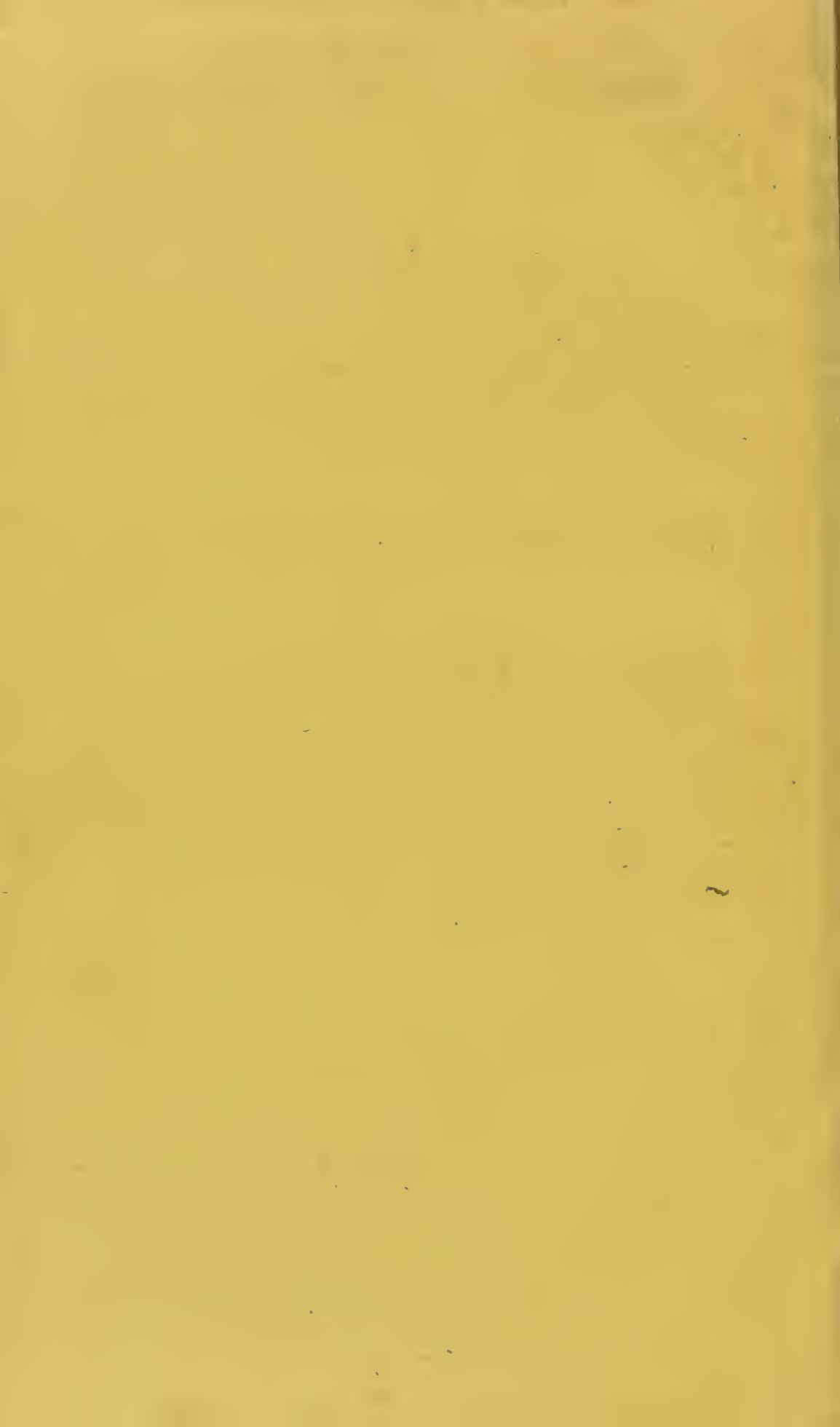
Who can tell what general statements are worth, without knowing on what evidence they rest? One man's many is another's few. Last month (Oct.) I saw 30 cases of fever,—to me these were few; to men with smaller opportunities of observing that disease, they would have been many. One man's frequent is another's seldom.

So much for the method I have adopted.

Finally, as an apology for the length to which this analysis has

extended, I may quote the following passage from the learned professor of physic in the Transylvanian University :—“ This question of the essential likeness or unlikeness of these two diseases,—typhus and typhoid fever,—is one of the most important and interesting questions of specific diagnosis that has ever occupied the attention of physicians;” and may observe, that if ever the question is to be settled, it must be by a careful analysis of all the symptoms, and all the pathological lesions, observed in all the cases of the two diseases which fall under the observation of the same physician during any given period of time, and then by tracing a number of cases of either disease back to their specific cause.





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